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PRINTED: 09/21/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: HUMBUG GOLD PROPERTY

ALTERNATE NAMES:
PATENTED CLAIMS MS 4346
QUEEN VEIN

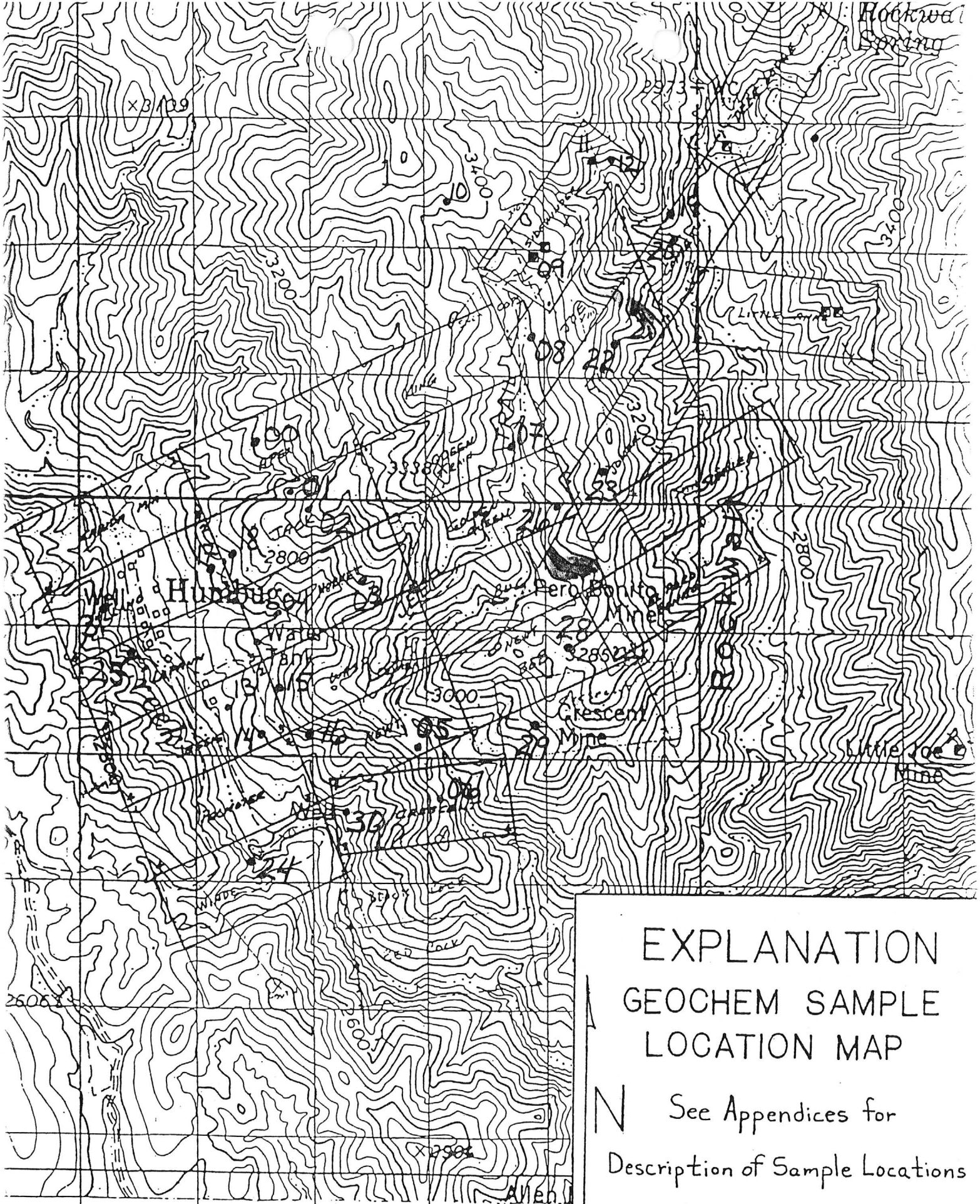
YAVAPAI COUNTY MILS NUMBER: 901A

LOCATION: TOWNSHIP 8 N RANGE 1 W SECTION 12 QUARTER NW
LATITUDE: N 34DEG 03MIN 08SEC LONGITUDE: W 112DEG 19MIN 24SEC
TOPO MAP NAME: COLUMBIA - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
GOLD
SILVER
LEAD

BIBLIOGRAPHY:
USGS COLUMBIA QUAD
BLM MINING DISTRICT SHEET 206
ADMMR HUMBUG GOLD PROPERTY FILE
CLAIMS EXTEND INTO SEC. 1



EXPLANATION

GEOCHEM SAMPLE LOCATION MAP

N

See Appendices for Description of Sample Locations

Humbug Gold Lode Claim Group.

Location: T8N. R1W. Sec. 1, 6.

SCALE
1"=1000'

CONTOUR INTERVAL
40 feet

HUMBUG MINE

YAVAPAI COUNTY

T8N R1W Sec 1,12
T8N R1E Sec 6

ABM Bull. 137 p. 60

Mines Register 1937 p. 433 - Fegart, Mrs. - Maricopa Ct,

Silver Queen Claims (file)
Mountain Chief Mines (file)

COLVO FILE + MAPS (MTN CHIEF)

...MARY REPORT OF MINERALS EXA...ION

State Ariz. County Yavapai Mineral Products Au, Ag, & Pb.

Name of property or deposit Humbug

Date examined 3/12/75 Engineer W.B. Dale Date of this report 3/17/75

Reason for examination Owners request

Engineer accompanied by Dr. Robert Hurt Address 6226 N. 27th Ave. Phx

...ent of property 5 pat'd. lode claims & 26 unpat'd. lode claims

Owner Dr Robert Hurt, 1/3 int. Address As above
Mr. Newton White, 1/3 int. Mayer Ariz.

Leased or optioned to No. one Address

Location of property (be specific) Secs 1 and 12, T 8N, R 1W.
reached by road from the Castle Hot Springs Rd.

Type of deposit and mineralogy (brief description) a large shear zone trending N 60° E. Contains numerous narrow quartz veins with high-grade gold, silver & lead minerals. Zone cuts Yavapai schist and contains pegmatite dikes.

Known dimensions of the deposit Length ± 1 mile Width ± 2000 Ft. Depth ± 200 ft.

Attitude of the deposit (strike, dip, etc.) Zone trends N. 60° E.
Quarts veins strike variously N.E and dip steeply north.

Possible extensions; correlation of known showings This mine presently can sustain small mine operation, and has potential for medium or large ~~-~~ size operation.

Mine workings (brief description or attach map or sketch) (indicate whether accessable)
Numerous small surface cuts, adits and shallow shafts on a half-dozen different veins.

(over)

Mining and milling equipment on property None

Past production (if any) A few thousand tons of ore carrying about ~~ton~~ 1 Oz. gold, 5 ozs. silver and 4% lead

Present rate of production (if any) None —

Sampling (describe briefly, or attach sketch) I cut 4 samples from narrow quartz veins for owner.

Tentative Estimate of Reserves

(Subject to revision when assays are received or after engineering calculations)

Measurable ..... tons ..... Grade .....

Indicated Several thousand tons Quartz Grade Au - 1.0 oz. Pb - 4.0 % Ag - 5.0 oz.

Inferred ..... tons ..... Grade .....

Mining method (actual or suggested) — Resuing

Milling or processing method (actual or suggested) Selective flotation.

Processing tests suggested .....

Tentative conclusion and decision This property needs thorough surface sampling program, then drilling program to determine Horiz & vert. extent.

To be accompanied by brief letter giving examining engineer's general impression of th deposit, his impression of the owner, and any other confidential information he may car to submit. Refer to any known prior examinations and reports. May be executed in pencil Should be mailed within 24 hours after examination is completed.

AN EVALUATION STUDY OF THE MINERAL RESOURCES IN THE LANDS OF THE YAVAPAI TRIBE OF INDIANS, ET AL AS DECIDED ON MARCH 3, 1965 AND AMENDED MARCH 24, 1965 BEFORE THE INDIAN CLAIMS COMMISSION

THE YAVAPAI TRIBE OF INDIANS, ET AL
VS.
THE UNITED STATES OF AMERICA

INDIAN CLAIMS COMMISSION
DOCKET NO. 22-E

VOLUME II

ROY P. FULL RICHARD F. HARTY
SHENON AND FULL
SALT LAKE CITY, UTAH

MARCH 1968

PREFACE

Volume II of "An Evaluation Study of the Mineral Resources in the Lands of the Yavapai Tribe of Indians of Arizona" includes excerpts from newspapers, historical writings, technical journals, Government and State publications, and other miscellaneous documents pertaining to the mineral development and mining activity during the period prior to May 1, 1873, and to that mining activity which followed that date as it reflects the development of the area.

PREFACE

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ARIZONA MINING JOURNAL

depth, which has exposed better ore on the lower levels than that encountered above, it can feel a permanence in the proposition.

February 1, 1924, p. 5, c. 1-3
p. 6, c. 1-3

Silver Mining in the Tip Top District

By O. A. Ensign

A brief history of the discovery and production of the mining properties in the Tip Top Mining District

During the winter of 1876-77, the Tip Top mine and silver were first discovered in what is now the Tip Top mining district by Messrs. Corning and Moore.

In the fall of 1876 Mr. John Corning came into Prescott, Arizona from the silver mines of Nevada. Among his acquaintances who had preceded him to Prescott were Col. C. P. Head, then a prominent merchant, and among his new acquaintances a southern gentleman, John (Jack) Moore, one time sheriff of Yavapai county. This was at a time when approximately the northeast one-fourth of all Arizona was Yavapai county. As business was dull in and around Prescott, particularly in the mining game, Corning and Moore decided to put in the winter down in the Humbug mining district, where the winters are ever mild and warm, prospecting and obtaining gold by the arrastra process--the poor man's way of milling "free" gold ore--extracting the gold from the quartz. They were grub-staked by D. C. Thorn, who "put up" for Moore, and C. P. Head and E. J. Cook who backed Corning.

On their way to that haven of gold and game--for then deer were plentiful--they followed the old Black Canyon road to the present site of Canon, Arizona, where Mr. Moore met his friend, Jack Swilling, who directed them over an obscure Indian trail leading from his place to Humbug Creek. It happened that this trail crossed the present Tip Top vein, and they found "float" ore heavily impregnated with "horn," or chloride of silver. Mr. Corning's prior experience with silver ore served him well in this instance.

They came down Tip Top Creek to the present site of Tip Top Camp, and camped. Thus they never reached their intended destination. Instead, they "staked" three claims, then known, as now, as the Tip Top, Tip Top South and Joker claims. Next they sent out ore samples for assay, and informed their partners in their venture of their find. Their assay returns showed very high grade ore and they employed a few miners and immediately began the extraction of high-grade.

A shipment of a considerable tonnage of $10,000 per ton ore, taken from the Tip Top South claim, attracted much attention in San Francisco. Among others, Mr. Dan Gillette and Mr. Charles Hoffman, who were searching for good properties for their respective companies, visited the property, liked what they saw, "threw

together" and bought the property for $60,000 spot cash.

It is said that Corning, Moore et al sold $150,000 worth of ore from the claims before the sale. Pretty fair for about a year's work! But mind you these sums were not all "velvet." While silver was around $1.28-29 an ounce and the ore rich in silver content, the freight rates from mines to San Francisco were $300 and down to $225 per ton of ore. Also there were other charges and commissions. And it must be remembered that at this time there was not one foot of our present transcontinental railways in the territory of Arizona.

The Gillette and Hoffman Tip Top Company, unpon taking over this property, began active operations. They drove the 100 foot adit along the vein for 600 feet through high-grade ore. They opened and drove the 200 adit along the vein over 800 feet, connecting the two adits by winzes. They also sank winzes 100 feet apart to the 300 level. Also they opened the 100 foot adit on the Tip Top South, and extracted much high grade therefrom, and started the 200 foot adit on that claim. During this time they added the Foy claims to their holdings.

In the meantime this company decided to install a 10 stamp chlorination mill at the town site of Gillette on the Agua Fria. This plant when completed consisted of two five stamp batteries of 1,060 pound stamps, a reverberatory roaster, four pans, two settlers, 60 horsepower boiler and engine, etc. This mill was completed in about 18 months from its inception.

During this time the ore was piling up on the dumps of the different claims, so to relieve the various dumps, trails were made, pack trains secured and ores transported to the mill site, nine and one-half miles from the mines. By the time the mill wheels were ready to turn, the mines had justified the judgment of the purchasers. The Gillette-Hoffman crowd had quite a long run with the chlorination plant, turning the silver from many tons of high grade ore into many bars of bullion of several thousand ounces each that would often grade up to 990 points fine out of a possible 1,000 points fine silver.

After the mill had been running night and day, for about eight months, the control of this property changed hands and a new management came in. Haggin-Head and associates acquired control of the Tip Top stock and George E. Webber was put in charge.

By this time it was pretty generally proven that the oreshoots, or lenzes, of the Tip Top vein inclined easterly, approximately 45 degrees. Mr. Webber ceased milling ore for a short time, and sank what is now termed the "main shaft," so as to connect with the 200 foot adit, then with the high grade oreshoot at 250 feet in depth. Ultimately Mr. Webber put this shaft down along the vein to a depth of 830 feet, passing out of the rich ore somewhere between the 600 and 700 levels. Under the management of Mr. Webber the Tip Top mines and mill were operated for about four years, or until October 15, 1883.

When the mill was running steadily the Tip Top company produced from $80,000 to $125,000 worth of silver bullion a month, depending upon the price of silver, as the price of silver began to decline. When the mill was operating at full capacity the payroll amounted to about $1,000 daily. Thomas Brown, mine superintendent during Mr. Webber's management, and Ben M. Belcher, merchant of Tip Top during all these years, estimated and agreed that from first to last the Tip Top company had produced over $4,000,000 worth of bullion.

When the Tip Top company quit, Mr. Brown was left in charge and he appointed a watchman. In time the watchman wanted some money. Mr. Brown had no company money and inquired of the watchman if he did not know of sufficient ore to pay his wages. The watchman did and proceeded to help himself. During his incumbency, about one year, he managed to save from $25,000 to $35,000 of his salary.

On January 1, 1885 the Tip Top holdings were dismembered and the Tip Top mine, rechristened the "Conqueror," fell into the hands of chloriders, who chlorided around in the old workings above the 300 level and sold over $125,000 worth of silver ore during their twelve years of occupancy. They did not work regularly and the greater part of what time they did work there were from one to four workmen, despite the fact that silver was steadily declining.

During the spring of 1886 the Conqueror boys sold their claim to the St. Louis & Yavapai Mining & Milling Co., accepting a ten year lease in part payment therefor. But wait! Let us turn back and see what the balance of the camp was doing all these years and leave the St. Louis & Yavapai for another chapter.

The Tip Top mines and the Peck mines seem to have been found about the same time and attracted the attention of prospectors and miners from all over the west. While the four claims of the Tip Top group were being developed about 1,000 men came into the district. About one-third of this number took claims, or leases on claims, other than the Tip Top group, and the sound of blasting could be heard throughout the silver zone, which was proven to be a territory about four by five and one-half miles in area. (The present Tip Top district was then a part of Humbug district.)

Yes, and the familiar saying of bygone days, "Have one on me," "Have another," etc., became quite common speech in Tip Top camp, for saloon men and merchants, as well as miners and chloriders, came to the camp. At one time there were three general merchandizing stores that could furnish supplies at retail or wholesale. From one to five eating places that compared favorably with the eating houses of today, together with 14 saloons where any wet goods from soda pop to good grade, genuine red liquor could be had at one bit - 12 1/2 cents - per. Right here I wish to remark, the Tip Top camp had a pretty decent lot of saloonmen. They kept places where the teetolaer could come and rest and seek diversion without being "nagged" because he was not a drinking man. In fact they had to be decent and fair or their houses would have been boycotted.

At this time Tip Top had a daily mail and stage and at least one big freight outfit came into camp every day and some days two and three of them, besides lesser freight outfits. By big freight outfits, I mean outfits consisting of one wagon and eight mules, up to three wagons and 15 mules. This camp contributed hundreds of thousands of dollars to the business of Phoenix, Arizona, for most of the ore was either sold direct, or through the banks of Phoenix to the smelters. In this district the genuine old chlorider, who produced thousands of tons of ore, was seen and heard for many years, long after the Tip Top company ceased to work.

Silver kept depreciating in price until about 1895, when it had dropped below 50 cents an ounce; then the last of the chloriders quit mining for silver. In the meantime the St. Louis and Yavapai (nicknamed the St. Louis & Apple Pie) Mining & Milling Co. had acquired the Conqueror (old Tip Top) claim and the Keystone claim; also they secured the chlorination mill at Gillette and moved the mill from Gillette to their property at Tip Top. They added concentrators to the old equipment and took about $235,000 worth of metals from their dumps. They melted their silver bullion into bars, unwatered the mines, using the water for concentrating their dumps.

The water from the mine lasted about eight months, after which they obtained water elsewhere. The mine being unwatered, it took 75 minutes out of 24 hours to empty the shaft sump by bucket. The company also did between 200 and 300 feet of drifting from the shaft and extracted several tons of ore, before silver got so low in price that they, too, gave up in disgust. Since their time this property has changed hands several times and feeble attempts were made to exploit it as a silver or tungsten property. Pittsburgh people have finally secured control of and now own three claims on the Tip Top vein and three claims on other veins, all in one block.

There yet remains on this property at least 40,000 tons of dumps, 20,000 tons of which should yield 15 ounces of silver per ton, or better. The stoped area should yield between 300,000 and 400,000 ounces of silver, some of it in place. Under the expensive process of working ores in those days (before power drills, concentrators, railroads, gas, etc.), ores of less than $250 per ton value were not considered worth while. Therefore, much ore of lesser value was left standing. Besides this, there is much high grade ore in place below the "stoped area."

There are three distinct shoots of ore on the Tip Top vein. Two of these shoots have been but scratched. I believe there is more silver remaining, untouched, in this united group of mines, than was ever taken therefrom, from which, with the present day methods of mining and milling, greater profits should be derived than were had of yore.

Outside of this group of claims there is not a 200 foot shaft, and with one exception (a grass root adit), not a 300 foot adit within this silver zone. Yet there are at least 100 claims that have produced shipping ore. Besides silver, there is some gold,

tungsten, lead, zinc, and antimony.

The formation of the district is for the greater part granite with lesser dikes of schist, or altered granite, usually interspersed. This formation has a trend or strike almost due northeast and southwest. The Tip Top series of veins course, or strike, a little more to the east than the general formation. There are several prominent rhyolite dykes that have yet another course, as they strike a little more to the north and south than the granite-schist formation. These dykes seem to interrupt or cut the general formation and Tip Top series of veins.

There is another series of veins whose usual strike is west of north and east of south. Where metal is found in these veins it usually consists of gold, lead and iron. There is yet another vein, or veins, known as the great cross cut fault vein. The general course of this is slightly east of north and west of south. This is one vein that the rhyolite dykes, nor other formations, do not seem to interrupt. This vein cuts them all and is traceable for at least five miles.

This district is well described in the language of a mining engineer, who was recently in the district. He said: "I have been in many mining camps before the one where the veins ran crisscross in all directions, but before this camp I never was in a district where the ore veins were so d----d persistent as they are here."

October 1, 1924, p. 11, c. 1-3
p. 26, c. 2, 3

The Discovery of the Silver King Mine

By Charles M. Clark
President of the Arizona Pioneers' Association

Mining in Arizona in the early days was accompanied by many adventures, but often brought rich returns

When the rich surface discoveries were made at Globe in 1876 there was living at Florence a man named Isaac Copeland, who had been through the Globe section about two years previous. On that trip he found heavy outcroppings carrying silver and copper, but due to their remoteness he did not locate them. As the rich discoveries made at Globe indicated an influx of prospectors, miners and possibly buyers, Copeland concluded to outfit and make further investigation of the croppings he had seen on his former trip. He induced three of his friends, Charlie Mason, a rancher; Billy Long, a stage driver, and Barney Reagan, a miner, to join him on the trip. Leaving Florence they rode to Picket Post, a flat topped mountain about five miles west from the present town of Superior, where they camped. The following day they worked their way east to the Stoneman grade, an old military road constructed by General Stoneman, but abandoned after reaching the summit of the mountain because of the heavy work required to cross Devil's Canyon, an immense gorge a few

TIP TOP DISTRICT

The Tip Top mining district is situated south of the Pine Grove and Black Canyon districts and east of the Tiger district. It lies approximately 35 miles southeast of the town of Prescott.[1/]

Activity in this district began in 1875 or 1876 with the location of the Tip Top mine. Hodge in 1877 referred to the region as the Black Canyon mines and described the activity as follows:[2/]

"But two other mineral belts remain to be described in Yavapai County, which are the new mines lately discovered by Jack Swilling, Jack Moore, Bob Groom, and others, in the southern spurs of the Bradshaw Mountains, west of the Black Canon, and the wonderful Clifton Copper Mines in the far southeastern part of the county, near the boundary line between Arizona and New Mexico.

The Black Canon Mines were discovered but a few months since, and are of that wonderful rich character, characteristic of the Peck, Silver Prince, and others previously mentioned. They are about sixty miles south from Prescott, and ten miles west from the Black Canon of Turkey Creek.

Within a radius of five miles, a large number of miners are now at work developing many lodes of rich silver ore, which yields from $300 to $600 per ton.

Among the principal lodes opened and now being successfully worked are the Tip Top, Rescue, Silver Jack, Fourth of July, Nevada, McDerwin, Fawn, George, Swilling, and several others equally promising.

The Swilling mine, owned by Jack Swilling, has a four foot vein carrying a ten inch strata of solid chloride ore. Ten tons paid in working $513 per ton. Second class ore assays from $100 to $300 per ton. The vein is well defined with good wall rocks.

The Tip Top Mine is owned by Jack Moore & Co., and is the best developed of any in the district. It has been thoroughly prospected by both shafts and tunnels. The vein is from fifteen inches to over two feet wide, and the ore assays from three hundred to thousands of dollars per ton. The ore worked has yielded an average of $550 per ton.

One mile up the canon from the Tip Top Mine is a location owned by Messrs. Brunson & Barnum, who have a two foot vein from which they have mined several tons of ore worth over $500 per ton.

1/ Plaintiff's Exhibit No. F-8
2/ Hodge, H.C., op. cit., pp. 110-112 (Vol. II, pp. 465-466)

The Fawn mine is on the Swilling Lode, and is owned by Mr. Mullen, who has a two foot vein of ore equally as rich as the others mentioned.

The George Mine shows rich ore at four different openings.

Two miles distant from the George Mine, Mr. J. Foy has taken out some very rich ore, which gave by assay $1,900 per ton.

D. C. Moreland, the original discoverer of the noted Vulture Mine, has also a good claim here, from which he is taking out quantities of $500 ore.

Bob Groom and other parties have locations quite similar, and equally as good as the foregoing. The ore from the Black Canon Mines has to be freighted either to the Aztlan Mill, a distance by wagon road of seventy-five miles, or to the Smiths Mill south of Wickenburg, a distance of over one hundred miles, at great cost and expense.

Good springs of water abound in and around this mining camp, but wood is scarce. When reduction works are erected conveniently near, and roads constructed, this new mining district will become one of the most prosperous in the Territory. Too high an estimate cannot be made of the vast amount of mineral wealth here stored up for man's use. The ores are easily worked, both by mill and furnace process, they being free carbonates and chlorides, with fine specimens of ruby and horn silver, in considerable quantities."

Hinton in 1878 described the region as being a part of the Humbug district, and stated:[1/]

"The other districts near Prescott are in a compact form. The most southerly, the Humbug District, reaches almost to the northern line of Maricopa county; its southwestern corner is about twenty miles east of Wickenburg; it is east of Silver Mountain and Castle Creek, between Humbug creek (which heads in the Bradshaw) and the Agua Fria, the source of which is in Lynx Creek, near Prescott. Less than three years ago the first location was made; now it contains several rich mines, for one of which $40,000 is reported to have been offered. The surface is undulating, and the formations are very different from those of the Peck, Turkey Creek, Lynx Creek, and Hassayampa districts consisting of micaceous, decomposed granite. Huge dikes, miles in length, of whitish granite quartzite, showing scales of mica sometimes two inches square, glittering in the sun like burnished silver, run across hill and dale from southwest to northeast, lying parallel at distances 100 feet to 1,000 yards apart; and between these are the veins of quartz carrying the precious metals. Assays, as reported from ten mines in this district, average over $1,000 per ton, ranging from $370 to $2,000. Products are respectively reported at $100, $440, $500, (two) $513, $550, and

1/ Hinton, Richard, op. cit.,pp. 31-32 (Plf. Exh. No. F-6, pp. 15-16)

$670 per ton, in some (perhaps in all) from selected ore. One mine assays on the surface $26.38 in silver, and $180.48 gold; and of another the estimate of surface product is $400 per ton. Mr. Pfister, assayer for the Tip-Top Company, states that the average of ore brought to him for assay by prospectors (with which the district is rapidly filling up) is $400 per ton. In the 'Tip Top' mine a streak of ore has recently been struck over twelve inches in width, assaying $11,000 per ton, and no change has appeared on it for twenty-one feet. The number of mines reported by name is thirty-seven."

Considerable development had been performed and production achieved by the year 1881 when Hamilton described the activity in the district as follows:[1/]

"Tip Top.--This district is about fifty miles southeast of Prescott in the spurs of the Bradshaw range. The camp has long been noted for the richness of its ores, and is a favorite of 'chloriders,' or poor miners who get out their 'rock' and have it reduced at custom mills. The formation is a micaceous granite and the veins though small, are compact and regular. The district has produced more bullion than any other in Yavapai county, and its mines steadily improve in size and richness as depth is reached. The Tip Top is the principal mine of the camp; it was discovered in 1875, and has been worked continuously ever since. The main working shaft is down nearly 600 feet, and the claim is thoroughly opened by levels, winzes, tunnels, etc. The vein averages from 1 foot to 18 inches in width; the ore is a sulphuret, carrying quantities of ruby silver and assaying $300 per ton. A 10 stamp mill and roaster is in operation on the Agua Fria, about nine miles from the mine. This is one of the best properties in the county, and has produced over $1,200,000. The Cross-cut is west of the Tip Top, and is the largest vein in the district. It is traceable across the country for several miles, and located nearly all the way. The Foy, a location on this ledge, shows 2 feet of ore assaying from $75 to $200 per ton. It is opened by a shaft 180 feet deep and several open cuts.

The Pearl, another location on the Cross-cut, is opened by a shaft 100 feet deep; it shows a strong vein of high grade milling ore, and is one of the most promising claims in the camp. The Swilling is north of the Tip Top; it has two shafts, 110 and 50 feet, respectively. It carries a 3 foot vein of milling ore assaying $50 per ton. The Virginia No. 2 is on Tula creek, about four miles from Tip Top. It shows 18 inches of free milling ore, ranging by assay from $100 to $1,000 per ton. The mine is opened by two shafts, 140 and 80 feet deep, and has produced $10,000 silver. What is known as the Rowe claim is near the Cross-cut; it contains some very rich ore, and is opened by a tunnel and several shafts. A number of tons of ore from this mine have been shipped to San Francisco, averaging from $500 to $1,000 per ton. The Basin mine is three miles west of the Tip Top. It has been worked for several years--the ore being

1/ Hamilton, Patrick, op. cit., 1881, pp. 51-52 (Vol. II, p. 386)

reduced in a custom mill--and has paid a handsome profit to its owners. The mine has produced a great deal of bullion, but the exact figures are not at hand. The '76' has a small vein of high grade ore of a similar character to the Tip Top, which assays from $200 to $1,000 per ton. Three tunnels--200, 120, and 85 feet each--have been driven on the claim. The Incas is a narrow vein of exceedingly rich ore assaying from $100 to $1,800 per ton. These are only a few of the claims of this district; there are scores of others which carry rich ore and give every promise of becoming valuable when developed. The ores of the camp are nearly all silver bearing."

In 1884 Hamilton reported the total production from the district to be over $2,000,000.[1/]

The later history of the district and a description of the Tip Top and other mines were given by Lindgren in 1926, as follows:[2/]

"Mining.--The Tiptop district is one of the oldest in Arizona. The first reference to it is in Burchard's mint report of 1883, which notes that the Tiptop mine had been worked since 1875 and had produced $2,000,000; also that it was (in 1883) closed for good, the ore being exhausted. The mine was reopened, however, from 1886 to 1888. Since that time the district has remained dormant, except for a little work on small properties.

A few years ago tungsten ore was discovered in the district, and a small amount of such ore was shipped. In 1922 no work of any importance was going on. The total production of the district is estimated at $4,000,000, which appears to be somewhat high. The history of the district is mainly the history of the Tiptop mine.

The Tiptop mine was located by Moore & Corning in 1875, and a year or two later it was bought by Dan Gillette and Charles Hoffman for $60,000. The original locators shipped some ore from it. Gillette built a mill on Agua Fria River near his ranch, and drove No. 2 tunnel. In 1878 Haggin obtained control of the company and the mine was worked successfully, yielding the bulk of its production until 1883, when, as noted above, it was considered to be exhausted. A little later it was relocated under the name Conqueror, and was held by the St. Louis-Yavapai Co. from 1886 to 1888. The mill was moved from Agua Fria River to the mine, and concentrators installed. The mine was worked on levels 5, 6, and 8; about $250,000 was extracted from sorting of the dump. Water was pumped from the Goat ranch on Boulder Creek, 3 miles below the property. Later, the mine was sold by foreclosure, and still later it was relocated by Wager Brothers. It is now said to be owned by Frank L. Carlisle. The property is in good condition and has for many years been cared for by Mr. O. A. Ensign, to whom acknowledgment is due for hospitality and much information.

1/ Hamilton, Patrick, op. cit., 1884, p. 173 (Vol. II, p. 405)
2/ Lindgren, W.,op. cit.,pp. 179-182 (Plf. Exh. No. F-5, pp. 150-152)

Some picked tungsten ore is said to have been shipped in recent years, and some leasing operations have been in progress from time to time.

The developments include a shaft 800 feet deep on the incline, in which water now stands about 400 feet below the collar. The principal tunnel, 200 feet below the shaft, is open, with the original timbers still in good condition. The tunnel connects with the shaft.

The total production of silver and gold is at best uncertain, but perhaps $3,000,000 would not be far from the mark. Silver predominates."

Similar but more extensive reports on the discovery and development of the Tip Top district were reported by O. A. Ensign in 1924,[1/] and by J. S. Coupal in 1936.[2/] The district was being rehabilitated in 1936 and a 50-ton flotation mill was installed, according to the latter report. The plans of the new operators were described as follows:[3/]

"The operating plans of the present company are to continue to mill the better grade sections of the dump, pull the stope fills, and break down the various pillars which remain in the stopes. This ore will be milled and the water in the mine used for milling. As the mine is unwatered it will be put in shape in the lower levels for continued mining."

The production by the Tip Top Co., which operated in the district until October 15, 1883, was estimated by Thomas Brown, the mine superintendent, and Ben Belcher, a local merchant, at over $4,000,000.[4/] Elsing and Heineman in 1936 reported the production of the Tiptop mine for the period 1875-1890 as being $200,000 in gold, and $2,000,000 in silver.[5/]

1/ Arizona Mining Journal, Feb. 1, 1924 (Vol. II, pp. 286-290)
2/ Ibid, July 30, 1936 (Vol. II, pp. 317-319)
3/ Ibid (Vol. II, p. 319)
4/ Ibid, Feb. 1, 1924 (Vol. II, p. 288)
5/ Elsing, M.J. & Heineman, R.E.S., op. cit., p. 102 (Plf. Exh. No. F-7)

GEOLOGIC EVALUATION OF THE HUMBUG GOLD CLAIMS

Humbug Mining District

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SUMMARY

The Humbug Mining District lies within Southern Yavapai County and on the southern extent of the Bradshaw Mountains. The Humbug District is within the Mountain Region, which lies between the Colorado Plateau to the northeast and the Desert Section of the Basin and Range Province to the southwest.

The oldest rocks within the region consist of the Yavapai Series which are 1.82-1.775 b.y. old and consist of some 40,000 feet of mafic to felsic submarine volcanics and clastic sediments. This greenstone belt has been folded, metamorphosed and intruded by granites 1.76-1.63 b.y.B.P. There is no record of sedimentary deposition or igneous activity in this area until the Laramide orogeny at which time small granodionite plutons were intruded into the Precambrian schist and granite. During the mid-Tertiary 40-20 m.y.B.P., a thick sequence of fluvial lacustrine and calc-alkaline volcanic rocks were deposited in the Phoenix basin which extends into the southern part of the Humbug Drainage. During the Late Tertiary (20-9 m.y.B.P.) basalt flows were erupted, and to the south basin and range faulting became important. During the last 9 m.y. volcanism and tectonism subsided and the dominant geologic processess have been erosion

and deposition of alluvium.

Geological environments potentially favorable for the occurrence of economic minerals in the region include Precambrian felsic metavolcanics, Precambrian granite contacts, Laramide plutons, mid-Tertiary plutons and volcanics. The felsic volcanics within the Yavapai Series are locally associated with copper, zinc, gold and silver-bearing massive sulfide deposits. Minor tungsten-bearing veins may be associated with Precambrian granite contacts. Au, Ag, and base metal occurrences are associated with small Laramide plutons. They occur mainly as veins along shears but some occur as breccia pipes. All are found to the north of the Humbug District, close to the intersection of ENE and NW trends, along which porphyry copper deposits are found elsewhere in Arizona. Au, Ag and base metal occurrences are associated with the mid-Tertiary rhyolite porphyry and granite intrusive into Precambrian rocks and Tertiary volcanics. They occur mainly as veins along shears but a few contain minerals disseminated in rhyolite porphyry.

INTRODUCTION

Purpose and Methodology

The purpose of the present study is to assess the potential for precious metal deposites within the Humbug District and specifically within each of the Humbug Gold Lode Claims. The compilation of pertinent geologic data was undertaken to aid in further investigation and development of the mineralized zones on the Humbug Gold Lode Claims. This assessment has been carried out by mapping and sampling of the area, through literature study of the geology, structure and economic geology of the area, and a consideration of the regional paleogeographic, plate tectonic and metallogenic setting of the Humbug District within the southern Cordillera. Thus, the assessment is not only based on data from the Humbug District itself, but also on metallogenic concepts within the regional paleogeographic and plate tectonic framework.

Location and Access

The Humbug District is located in southern Yavapai County, central Arizona. It occupies the central portion of the Columbia Quadrangle, 7.5 minute series topographic map. (USGS)

The Humbug Gold Lode Claims are about 10 miles due north of the Lake Pleasant Regional Park located approximately 20 miles north-north west of Phoenix, Arizona. Access to the property is by approximately 17 miles of light-duty roads from the Lake Pleasant Regional Park via State Highway 74. Highway 74 is accessable via Carefree Highway interchange on Interstate 17 about 20 miles north of Phoenix, Arizona.

The Humbug Gold Lode mining claim group consists of 5 patented mining claims and 17 unpatented lode mining claims. The unpatented claims are

located on Federal Land (Bureau of Land Mangement) in sections 1,12 Township 8 North, Range 1 West and section 6 Township 8 North, Range 1 East GSRBM; along Humbug Creek and Rockwall Gulch in the Humbug Mining District, Yavapia County, Arizona.

GEOLOGY

The Mountain Region of central Arizona is an area where the geology is transitional between the Colorado Plateau to the northeast and the Desert section of the Basin and Range Province to the southwest. In the Colorado Plateau area, little deformation has occurred since the Precambrian, and Palozoic and Mesozoic sedimentary rocks are typically little deformed. To the southwest, the area has been affected by a mid-Mesozoic orogeny and magmatic arc; Laramide orogeny magmatic arc and metallogenic event; a mid-Tertiary orogeny, magmatic arc, metamorphic core complex emplacement and a metallogenic event; and a Basin and Range disturbance accompanied by basaltic and locally bimodal volcanism (Reynolds, 1980). The structure in this southwestern part of Arizona is in general extremely complex (Davis, 1981).

The lithology and stratigraphy, structural geology and tectonics, and geologic history of the region are described in this section in order to facilitate the assessment of mineral potential within the Humbug District, and specifically within the Humbug Gold Lode Claim group.

Rock Units

In the region rock units present include meamorphic and igneous Precambrian rocks, Cretaceous (?) intermediate and felsic volcanic rocks and intrusives, and Late-Tertiary valley-fill sediments and basaltic volcanics.

Older Precambrian Rocks

Older Precambrian rocks in Arizona crop out extensively along the northwest-trending Mountain Region which encompasses the Southern Bradshaw Mountains. They have been divided into three distinct northeast-trending belts. (Titley, 1982), which according to Anderson (1976) accreted onto the North American craton from the southeast. The northwestern of these belts consists of gneisses which are in part metavolcanic, were deposited about 1.8 b.y.B.P. (Titley, 1982), and have been metamorphosed to the amphibolite facies. The central belt consists of the Yavapai Series which were deposited 1.82-1.775 b.y.B.P. (Anderson and Silver, 1976). According to Anderson and Silver (1976) and Titley (1982) this is a greenstone belt which is some 40,000 feet thick. The southeastern belt consists of the Pinal Schist which was deposited 1.7-1.6 b.y.B.P. (Silver, 1978) and consists of quartz, muscovite schist, arkose and quartzite (Titley, 1982). These Older Precambrian rocks were metamorphosed and intruded by granites during the Arizonan Revolution 1.76-1.63 b.y.B.P. (Damon, 11958), and were intruded by anoregenic granites 1.5-1.4 b.y.B.P. (Silver et al., 1977).

The Humbug-Tiptop Districts lie entirely within the central belt of the Yavapai Series which have been extensively intruded by Precambrian granites. The geology of the Yavapai Series in central Arizona has recently been summarized by Donnelly and Hahn (1981). Within the region they provide stratigraphic information to the north of the area (the Cleater Belt); on the north-south striking belt east of the area (the Black Canyon Belt); and to the southeast of the area (the New River District).

Within the Yavapai Series in general, volcanism tends to follow cycles from mafic to intermediate to felsic folowed by deposition of

sediments. The exhalites typically occur on top of, or on the flanks of a rhyolitic volcanic center or in the immediately overlying sediments (Anderson and Nash, 1972; Anderson and Guilbert, 1979; and Hahn, 1981). The metavolcanic rocks have undergone two periods of folding and are generally in the greenschist facies. They have been altered to chlorite-rich rock near massive sulfide deposits (Anderson and Nash, 1972), and contact with Tertiary dikes.

Precambrian granites are widespread throughout the region and they intrude the Yavapai Series. They range in composition from quartz monzonite to granodiorite, and in the Cleater, Jerome, and Humbug-Tiptop areas were intruded 1.77 b.y.B.P. (Donnelly and Hahn, 1981). Elsewhere in central Arizona batholiths were emplaced 1.77-1/72; 1.70-1.65 and 1.5-1.4 b.y.B.P. (Silver et al., 1977; Donnelly and Hahn, 1981). The Crazy Basin Quartz Monzonite is the host in the Humbug-Tiptop Area.

Younger Precambrian

Younger Precambrian sediments including the Pioneer Formation, Dripping Springs Quartzite and the Mescal Limestone (Apache Group) crop out to the southeast (Wilson, 1962) but do not crop out in the area nor to the south, north or west of the region. Apparently this region was an upland at this time and no sedimentation took place. Intruded into the Apache Group sediments are diabase sills whihch, according to Damon (1968) and Silver et al. (1977) were intruded 1.2 to 1.1 b.y.B.P. In the Humbug District diorite porphyries, diorites, and gabbros intrude Precambrian Yavapai Series and Pecambrian granitic rocks and could be correlative of the diabase which intrudes the Apache Group.

Palezoic

Paleozoic sedimentary rocks in Arizona range in age from Cambrian to Permian and consist mainly of quartzite, dolomite and limestone. They consist of Bolsa Quartzite, Abrigo Formation, Martin Formation, Escabrosa Limestone, Supai Formation, Coconino Sandstone and Kaibab Limestone or their stratigraphic equivalents (Wilson, 1962). The sediments were laid down in a shelf environment, to the east of the Cordillerean geosyncline from which they are separated by the Wasatch line (Burchfiel, 1979). No Paleozoic sediments crop out within the region which at the time formed a positive area known as Mazatzal Land (Wilson, 1962). Paleozoic sediments were thus probably never deposited in the area covered by the Bradshaw Mountains.

Laramide Orogenic Period

The Laramide was a period of volcanism intrusion and intense tectonic activity in southern Arizona. It is of particular importance because a large number of porphyry copper deposits were formed at this time, especially in southeastern Arizona (see, for instance, Damon and Manger, 1966; Shafiqullah e. al., 1980; Titley, 1981; Heidrich and Titley, 1982). The magmatic and tectonic activity took place during the southeastward sweep of the magmatic arc, possibly as a result of the decrease in the dip of the Benioff zone at this time (Conely and Reynolds, 197; Clark et al., 1982).

The Humbug District lies within a northwest-striking Laramide arc, however, no known Laramide intrusions occur within the district.

Mid-Tertiary Rocks

Mid-Tertiary rocks are here defined to include all sedimentary and

igneous rocks deposited after the Laramide orogeny and the post-Laramide period of peneplanation, and before Basin and Range-type faulting became dominant. These pre-Basin and Range rocks have been divided into three units by Eberly and Stanley (1978) and Scarborough and Wilt (1979).

The lowest unit consists of indurated brown arkosic fluvial sandstone, fanglomerates of gneissic and granitic provenance up to 300 feet thick, and minor lacustrian sediments with some algal limestone. Andesitic to rhyolitic volcanics increase in abundance toward the upper part of this unit.

The middle unit is characterized by voluminous intermediate to felsic volcanism that is associated with the mid-Tertiary orogeny. The volcanics consist of flows, ash flow tuffs, tuff breccias and ash of latitic, quartz latitic, rhyolitic and trachtic composition, and flows and flow breccias of basaltic, basaltic andesite and andesitic composition (Reynolds, 1980). Small intrusions of the above compositions are also present. The volcanic rocks are interbedded with red sand and gravel fluvial deposits, massive fanglomerates and lacustrine deposits with local organic-rich facies, algal limestones and water-laid tuffs.

The upper unit consists of grayish brown poorly consolidated sandstones, fanglomerates, mudstone and water-laid tuffs. The rocks contain abundant volcanic debris. They are overlain and intercalated with basaltic volcanics.

The mid-Tertiary rocks rest unconformably on Precambrian, Paleozoic, Mesozoic and Laramide rocks. They were deposited in northwest-striking basins which were tilted northeastward and southwestward. (Scarborough and Wilt, 1979).

Tertiary sediments crop out in south, north-central and northwestern part of the area. They have been examined in the southern part of the

region by Scarborough and Wilt (1979) at Lake Pleasant, New River Mesa and New River. Here they consist of calcareous mudstones, limestone and dolomites, red lithic tuffs, rhyolitic air-fall deposits, agglomerates, ash-flow tuffs, andesite flows and breccias. They have been dated at 26.5-21.3 m.y.B.P. They rest unconformably on Precambrian and are overlain unconformably by a basalt dominated sequence.

The units south of the Humbug District but north of Lake Pleasant are also part of the mid-Tertiary sequence. Scarborough and Wilt (1979) indicate that it is alkali-calcic in nature and was deposited 30-13 m.y.B.P. It consists of andesitic flows and tuffs (Wilson et al., 1969) but also contains dacite rhyolite and felsic tuffs (U.S.G.S., 1981). The mid-Tertiary rocks in the area are thus dominated by intermediate to felsic volcanics and can thus probably be correlated with the middle unit of Eberly and Stanley (1978).

Late Tertiary

Late Tertiary deposits are found in most of the tectonic basins formed during the Basin and Range distrubance. The deposits consist of poorly consolidated, tan-colored fanglomerate sandstone and siltstone of fluvial and lacustrine origin and lesser basaltic volcanics (Scarborough and Wilt, 1979; Reynolds, 1980). The Late Tertiary deposits rest unconformably on mid-Tertiary rocks and were deposited after the transition from the mid-Tertiary orogeny to the Basin and Range disturbance. According to Shafiquallah et al. (1981) this transition took place sometime between 19-12 m.y.B.P., depending on the location within southern Arizona.

Latest Tertiary and Quatrnary

During the late 9 m.y. volcanic activity and tectonism have slowed down (Shafiqullah et al., 1981) and during the last 4 m.y. the dominant geological procession in the Basin and Range Province have been erosion of mountain ranges, formation of extensive pediments, deposition of fanglomerates and deposition of alluvium along the major creeks and drainages.

Pediment surfaces have formed and fans have been deposited in the southern part of the region facing the Phoenix basin.

Structural Geology

The Southern Bradshaw Mountains lie within the North American craton, east of the Wasatch line and close to the boundary between the Colorado Plateau and the Basin and Range Province. It has been affected by tectonism during the Proterozoic, Laramide and mid-Tertiary orogenies, and most recently by the Basin and Range disturbances.

During the Arizona Revolution 1.76 to 1.65 b.y.B.P. according to Damon (1968), the Precambrian rocks were folded about ENE striking axes and underwent N-S to NNW faulting (Davis, 1981). The Colorado Lineament, a major strike-slip fault, was initiated about this time according to Warner (1978).

No pronounced tectonic or igneous activity took place during the Paleozoic. During the Mesozoic southwestern Arizona was strongly affected by a mid-Mesozoic magmatic arc and a later period of metamorphism and folding, but the effects of these apparently did not reach the Southern Bradshaw Mountains.

The Laramide was a period of intense tectonism and localized magmatic activity which was associated with the southeastward migration of the

magmatic arc (Coney and Reynold, 1977; Lowell, 1974). Probably related to ENE plate motion and compression are basement-colored uplifts and thrust faults which strike NNW to NW (Nielsen, 1979; Davis, 1981); WNW left lateral strike slip faulting of the Texas zone of Schmitt (1966); and the ENE-striking tensional features (Rehrig and Heidrick, 1976). Laramide plutons associated with porphyry copper mineralization have a pronounced NNW to NW trend and a secondary ENE trend (Heidrick and Titley, 1982). The former is parallel to the Laramide magmatic arc and the trend of the basement-cored uplifts and the latter is parallel to Precambrian fold axes and Laramide tensional features. The most pronounced Laramide tectonism and magmatic activity lies to the south of the region but a NW and an ENE trend of mineralized Laramide plutons intersects to the north of the area.

The mid-Tertiary orogeny lasted approximately from 34 to 14 m.y. B.P. (Shafiqullah et al., 1980) and involved eruption of large volumes of volcanics, emplacement of metamorphic core complexes and listric normal faulting. The geologic events accompanied the westward migration of the magmatic arc, possilby as a result of the steepening of the Benioff zone at this time (Coney and Reynolds, 1977). In southern and southwestern Arizona enormous volumes of egnimbrites were erupted. South of the Humbug District andesites and associated more felsic rocks were erupted at this time.

Between 19 and 12 m.y.B.P. a transition occurred between the mid-Tertiary orogeny and Basin and Range faulting. In the Humbug District transition appears to have been between about 21 and 16 m.y.B.P. The Basin and Range faults strike NW to N-S and are high angle fautls (Davis, 1981). The presentday ranges and basins result from this tectonic episode. South of Humbug District structural depressions filled with Late Tertiary sediments formed at this time, as was the Phoenix Basin. The Basin and

Range tectonic episode was terminated about 4 m.y.B.P. (Shafiqullah et al., 1980).

Geologic History

The geologic history of central Arizona is long an complex and only a brief synopsis is presented here. Excellent summaries of the main geological events that affected the southern part of the North American Cordillera are given by Burchfiel (1979) and Dickinson (1981). More detail accounts pertaining to southwestern Arizona are given by Shafiqullah et al. (1980) and Reynolds (1980). The geologic history can be summarized as follows:

1. Volcanic and clastic rocks of the Yavapai Series were accreted onto the North American continent from the southeast 1.8-1.7 b.y.B.P. (Anderson, 1976; Anderson and Silver, 1976; Silver, 1978; Titley, 1982). The rocks were folded about northeasterly axes, metamorphosed to the greenschist facies and intruded by granitic batholiths during the Arizona Revolution about 1.7-1.6 b.y.B.P. (Damon, 1968).
2. Sometime after this the area was uplifted and eroded. To the east the land was submerged beneath epicontinental seas and shallow marine clastic sediments and carbonates of the Late Proterozoic Apache Group were deposited. These were intruded by diabase sills 1.1 to 1.2 b.y.B.P. The local region remained above sea level at this time. Mafic intrusions in the Humbug District may be related to the diabase sills.
3. During the Paleozoic a clastic and carbonate shelf sequence was deposited over much of Arizona. The Southern Bradshaws remained an upland (Mazatzal Land) during much of this time, and no Paleozoic

sediments were deposited there (Wilson, 1962).

4. During the Mesozoic, continental red beds were deposited to the north (Dickinson, 1981), and in southwestern Arizona a magmatic arc developed and was followed by a period of folding and metamorphism (Reynolds, 1981). The area covered by the Southern Bradshaw Mountains remained upland (Mogollon Highlands) (Dickinson, 1981) and apparently was not affected by the above events.

5. The Laramide was a period of intense tectonic activity in southern Arizona. It was characterized by tectonism resulting from compression in the northeast-southwest direction (Davis, 1981) and intrusion of epizonal granitc plutons along NW and ENE trends (Heidrick and Titley, 1982). Two of these trends, which are related to porphyry coper mineralization, intersect to the north of the Humbug District.

6. The mid-Tertiary orogeny lasted from about 35-14 m.y.B.P. in southern Arizona. During this time a great thickness of fluvial and lacustrine sediments and felsic to intermediate volcanics were deposited in northwest-striking basins, metamorphic core complexes were emplaced, and the area was affected by listric normal faulting (Eberly and Stanley, 1978; Scarborough and Wilt, 1979; Shafiqullah et al., 1980; Davis, 1981). Mid-Tertiary intermediate to felsic volcanics are present in the southern part of the area, but the effects of metamorphic core emplacement and listric normal faulting are not evident.

7. Between 19 and 12 m.y.B.P. the mid-Tertiary orogeny subsided and a transition into Basin and Range steep normal faulting took place (Shafiqullah et al., 1980). Within the Tip-Top Humbug Distirct this transition probably took place between 20 and 16 m.y.B.P. The Basin

and Range faulting was accompanied by thick accumulation of fluvial and lacustrine sediments in the basins and eruption of basaltic volcanics. South and east of the Humbug District basalts and interlayered tuffaceous sediments were deposited at this time.

8. During the last 9 m.y. volcanism and tectonism have subsided (Shafiqullah et al., 1980) and the dominant geological processes have been erosion and deposition of alluvium.

Mineral Deposits

Geological environments to be considered as potentially favorable for the occurrence of mineral resources within the Humbug District included the following:

Older Precambrian metamorpic roks (Yavapai Series)

Older Precambrian granitic rocks (Crazy Basin Quartz Monzonite)

Younger Precambrian Diabase sills

Mid-Tertiary volcanic rocks (Diabase and Rhyolite Porphyry)

Recent alluvium (Colluvium below veins and stream channel deposites)

Older Precambrian Metamorphic Rocks

Numerous occurrences of massive sulfide deposits are found in Precambrian rocks in Arizona. They are invariably associated with submarine rhyolitic volcanism (Donnellly and Hahn, 1981), and are either of the proximal or distal type (Anderson and Guilbert, 1979). The proximal deposits are copper - and locally zinc-rich and were formed above or on the flanks of rhyolitic centers; the distal ones are zinc - and relatively lead-rich, contain silver and gold and were formed at the same time as the proximal deposits, but in an adjacent basin. The massive deposits are associated with banded iron formations which are zoned, with sulfide

facies near the rhyolitic center and carbonate and oxide facies more distant (Anderson and Guilbert, 1979). Felsic metavolcanic rocks occur within the Yavapai Series, which lie to the northwest of the Holbrook Line. To the south of the Holbrook Line lie the Pinal Schists which are generally non-volcanogenic. Most of the ore produced from massive sulfide deposits in Arizona came from the Jerome area to the north of the Bradshaw Mountains. Here the United Verde and United Verde Extension deposits (both proximal) produced 30 and 4 million tons of ore, respectively. In contrast, the production from all other massive sulfide deposits in Arizona totals only 9 million tons of ore (Donnelly and Hahn, 1981).

Within the region eleven named massive sulfide deposits are known. Proximal types include Pentland, Hackberry, Blue Bell, DeSoto and New River; distal types include Peck, Swastika, Gladiator, Golden Belt, Kay and Orizaba. Of these the Blue Bell deposit produced the most ore at 2 million tons.

Some scheelite + wolframite veins may also be of Precambrian age. Tungsten and beryllium occurrences are associated with Precambrian granitic pegmatites and aplites, and are also close to Precambrian intrusive contacts and could be associated with Precambrian plutonism.

Laramide Intrusives

The Laramide was a time of emplacement in all but one (Bisbee) of the porphyry copper depsits in Arizona and adjacent New Mexico and Mexico. Of the 35 major porphyry copper deposits in this region, 32 lie to the south of the Holbrook Line, where basement is Pinal Schist and three lie to the northwest where basement consists of Yavapai Series and gneissic-metavolcanic terrain. The intrusives associated with the porphyry copper deposits were emplaced during the westward sweep of the magmatic

arc (Damon et al., 1981; Clark, et al., 1982), possibly related to the decrease in the dip of the Benioff zone at this time (Coney and Reynolds, 1977). The porphyry copper deposits appear to be aligned along northwest and east-northeast trends (Heidrick and Titley, 1982). The northwesterly trend is sub-parallel to Mesozoic linear discontinuities in depositional patterns (Titley, 1976); the trend of Laramide basement-cored uplifts and thrust faults (Nielsen, 1979; Davis, 1981); the Texas zone of Schmitt (1966); and the trends of the Laramide magmatic arcs. the ENE trend is subparallel to Precambrian fold axes and to Laramide tensional features (Rehrig and Heidrick, 1976). The intrusions related to the porphyry copper deposits are small in area (seldom over 3 square kilometers) and may have been emplaced along the NW and ENE structural intersections.

The region lies entirely within the major northwest-trending zone of porphyry coppper deposits, and a subsidiary ENE-trending zone cuts across the northern half of the area. However, it is entirely underlain by Yavapai Series basement, a region where major porphyry copper deposits are rare. In fact only 3 out of 35 major porphry copper deposits in the southwest lie outside the area underlain by Pinal Schist.

Many hydrothermal deposits are associated with Laramide intrusives in the region to the north of the Humbug District. These occurrences lie within the Cleator and Crown King Areas where the ENE - and NW-trending zones overlap. The deposits occur within Precambrian schist and granite and are associated with small Laramide granodioritic plutons. They occur largely as veins along shears but a few occurrences contain disseminated mineralization in breccia pipes. Most of the occurrences carry Au, Ag, Cu, Pb and Zn. The most important primary minerals are pyrite, chalcopyrite, sphalerite, galena and, less commonly, tetrahedrite, chalcocite, argentite, barite and ankerite.

Mid-Tertiary Volcanic Rocks

Mid-Tertiary volcanics in southern Arizona, southwestern New Mexico an Mexico are associated with gold/silver and base metal lode deposits (Damon et al., 1981; Clark et al., 1982). The volcanics were erupted when the magmatic arc swept rather rapidly westward, possilby as a result of the steepening of the Benioff zone (Coney and Reynolds, 1977). In southwestern New Mexico the deposits are associated with cauldrons from which voluminous ignimbrites and other volcanics were erupted (Elston, 1978). As yet, no such cauldrons have been identified in Arizona, but the voluminous ignimbrites and presence of numberous deposits suggest that such cauldrons could be present. In the area mid-Tertiary volcanics are not extensive. If cauldrons were ever present in the area, they have been largely eroded away.

Within the South and Central Bradshaw Mountains at least 30 deposits appear to be associated with mid-Tertiary epizonal plutonism and volcanism. The deposites roughly form a northeast trending ellipse with the deposites in the Humbug District falling on the southeast portion of the ellipse. The deposits generally lie southwest of Cordes and northeast of the Wickenburg Mountains. They occur within Precambrian schist and granite and Tertiary volcanics but appear to be associated with Tertiary hypabyssal rhyolite, rhyolite porphyry and granite porphyry intrusives. They occur largely as veins along shears, but in a few occurrences ore minerals are disseminated in rhyolite porphyry and diabase. Most of the occurrences carry Au, Ag, Cu, Pb and Zn, but some occurrences carry W; and a few carry Be. The most common primary minerals are pyrite, chalcopyrite, sphalerite, galena, and ruby silvers; less common are tetrahedrite, scheelite, wolframite, arsenopyrite, stibnite, pyrolusite and psilomelane.

LOCAL GEOLOGY AND STRUCTURE

The mineralized zones on the Humbug Gold Lode claims occur in assdciation with mineralized rhyolite porphyry dikes and mineralized diabase sills. The strike length of the mineralized zones and associated structures extend for almost 7000 feet locally. The subparallel nature, extensive strike length, favorable assay results and number of mineralized zones suggests an economic deposite might be developed from a number of veins on the claim group.

The oldest of the major units to crop out on the Humbug Gold claim group; the Yavapai schist, comprises thinly foliated quartz-mica schist, quartz-mica-hornblende schist and gneiss, feldspathic hornblende gneiss, quartz-feldspar-mica gneisses, amphibolite, epidosite, impure quartzite, and a variety of migmatitic rocks. Most of these are rocks of middle metamorphic rank, as evidenced by the presence of hornblende, garnet, biotite and calcic plagioclase. In general they are silvery gray to very dark greenish gray and form darker more eroded surfaces that contrast with the lighter colored more resistant granitic rocks and rhyolite porphyry dikes.

The Yavapai schist was first described from the Bradshaw Mountains to the north. Its general characteristics have been summarized by Darton and some of its occurences to the north and northeast described by Lindgren, Wilson, Anderson and others. They have shown that these rocks are divisible into stratigraphic and lithologic units that can be traced for considerable distances.

Younger Precambrian intrusive masses of porphyritic rhyolite; diorite and gabbro are present locally. Most of these masses are small with widths

measuring tens of feet. About 5000 feet is their maximum known exposed length. These younger intrusive rocks are similar to those described by Anderson from the Bagdad and Prescott-Jerome areas, where they are younger than the Yavapai schists and older than the principal Precambrian granitic rocks of the region. The diabase just west of the townsite of Humbug could be of similar origin, but is possibly Tertiary age.

Granitic intrusive rocks are very abundant and are the dominant host rocks over a large area locally and to the north and east. The northern terminus of the Crazy Basin Quartz Monzonite is exposed southwest of Cleator. This batholith extends southward approximately thirty (30) kilometers encompassing the Humbug and Tiptop mining districts. It is the preferred host for the emplacement of gold and silver rich quartz veins in the Humbug Gold Lode claims.

The most widespread type is a medium to pinkish gray, medium to coarse grained and even slightly porphyritic rock in appearance. It consists mainly of potash feldspar, quartz, muscovite, and plagioclase. Biotite is the most abundant dark consituent, a little hornblende is present locally. The Crazy Basin Quartz Monzonite is one of the youngest of the Precambrian rocks in the district. (1.76 b.y.B.P.) The rock is relatively unfoliated which indicates that this intrusive postdates the metamorphic and deformational events which affected all previously described units. Masses and dikes of pegmatite are abundant in both the granitic rocks and the older metamorphic rocks. Pegmatities are the portion of a melt from a large grantitic intrusion that were not used in the initial formation of the bulk of the granite. They intruded the parent rock along zones of weakness during the last stages of igneous activity. The pegmatitic zones are usually parallel and adjacent to the main structural features and comprise the wallrock for some of the gold and

silver bearing sulfide rich quartz veins. However, in the central portion of the claim block several of these late stage pegmatite dikes are emplaced perpendicular to the general structural trend of the area. It was observed that several mineralized zones terminate against them, suggesting they possilby acted as structural barriers to migration of some of the mineralized fluids. Rhyolite porphyry dikes were observed cutting some of the pegmatite dikes which strike to the northwest; perpendicular to local structure.

To the north, possibly three episodes of deformation occurred in metavolcanic and metasedimentary rocks of the Bradshaw Mountains during the Precambrian. A foliated greenschist facies resulted. The Crazy Basin Quartz Monzonite apparently intruded preexisting foliated and metamorphosed rocks of the Yavapai Series as a diapir. This caused local folding and faulting of the metamorphosed rocks, but did not disturb the trend of foliation in many areas. The strong foliation possibly imposed the existing subparallel structure on the intruding quartz monzonite.

The intruding quartz monzonite possibly displaced, absorbed, and melted much of the Yavapai series regionally. The remaining slivers and wedges of Yavapai series were trapped as xenoliths in the Crazy Basin Quartz Monzonite host. Generally the mafic xenoliths display chloritic alteration and the felsic xenoliths are generally altered to sericite.

Regional metamorphism is not related to the emplacement of the Crazy Basin Quartz Monzonite. Some local retrograde metamorphism or hydrothermal alteration is associated with the intrusive; implying that the scattered zenoliths of Yavapai Series of amphibole metamorphic grade had wider extent.

Several Tertiary rhyolite porphyry dikes crop out in the area between the Tiptop mine (4.5 miles to the east) and Humbug Creek. Several

subparallel branching rhyolite porphyry dikes were observed to have slight different mineralogical compositions as they swarm to the northeast of for almost two miles. The dikes are intersected an faulted by seven or eight major gold and silver veins striking east and northeast and numerous minor veins and veinlets. The dikes are generally fairly narrow, 10-15 feet wide, but they can swell to over 100 feet wide. Sometimes the mineralized veins widen and corresponding swell near the dike dilations. The rhyolite porphyry is considerably altered, forming dull buff outcrops, but phenocrysts of quartz and feldspar can be observed locally. The gound mass is reportedly fine granular quartz and sericitized alkalic feldspar.

Quartz veins and lenses are rather common and quite variable in appearance and composition. They have been worked for gold, silver, tungsten, copper and lead in several parts of the district. Also present are somewhat thicker more irregular masses of pegmatitic quartz, most of which contain a little perthite and some of the accessory minerals that are typical of the less quartz rich pegmatites of the district.

The mineralized veins are typical gold-silver fissure veins, fairly straight with moderate width and fairly long strike length.

The veins are fairly abundant and continuous. Generally they are uniform in character, with the vein being strongly silicified and having well defined hanging and foot walls. Quartz is the dominant and almost only gangue mineral. Sometimes the veins ocur as lenses or pods in sheared zones in the main structures, or as parallel systems in the brecciated host. Brecciated weakly mineralized and moderately silicified wallrock commonly occurs adjucent to the veins. The veins range in strike from N40E to E-W but most lie between N40E to N80E. The dip is generally steep to the northwest to vertical with about 75NW being about average.

Vein width ranges from 1 inch or less to 6 feet but averages slightly

less than a foot. Where the strike changes or the dip flattens, their thicknesses appear to be above average. Generally the old workings in the area occur on swells in the vein in oxidized ore, local swells in the veins can have three dimensional extent which comprises an ore shoot. The vein filling is chiefly milky-white quartz which is stained on weathered surfaces and in fractures by limonite. Locally it contains vugs lined with quartz crystals and sometimes displays comb structures. The earlier deposited quartz is coarse comb quartz and the latter fine grained and mineralized. Sulfide minerals are fairly abundant. Wolframite, arsenopyrite, pryite, sphalerite, bornite and galena comprise the ore with paragenesis in the order given.

Pyrite, galena and a steel gray sulfides occur as masses and as irregular grains intergrown with quartz are easily detected in most vein samples. Bornite, chalcopyrite, arsenopyrite, tetrahedrite, gold and silver occur as minor yet important consitituents of the veins. Some gold is free and may be megascopic, but also is derived from oxidized sulfide minerals. The primary source of silver is probably galena, but native silver, ruby silver, argentite and cerargyrite have been documented. Gold and silver are associated with sulfide minerals in almost all assay samples with appreciable gold and silver values. This spatial relationship suggests contemporaneous deposition. Most oxidized surface material has strong limonite and hematite stain. Limonite and hematite occur as coatings and fracture filling but more importantly as well developed boxwork or gossan after oxidized sulfides.

Adjacent to the quartz veins, limonite has stained the quartz monzonite and pegmatitic zones orangish and rusty brown. Generally mafic minerals are absent, and the plagioclase is sericitized and altered to albite. Further from the veins chlorite has replaced biotite and

hornblende, the plagioclase is saussuritized and quartz-epidote veins are locally present. Most alteration of the granitic host is of the contact type rather than pervasive. The veins are also similar to ones found in some of the surrounding districts. The gold-silver fissure type veins of the Cherry District southeast of Jerome are very similar to the veins in the Humbug-Tiptop Districts. Here a younger Precambrian granite invaded the Yavapai Series with both compositional and structural similarities. Tertiary rhyolite dikes were emplaced and mineralization soon followed. The similarities in genesis, alteration, structure and mineralization are notable. The Tertiary gold-silver veins associated with grandodiorite stocks of similar age in the northern Mt. Union Quadrangle show some similarities.

Most of the veins of the Humbug Gold Lode Claim Group strike east-northeast about parallel to the veins in the Tiptop, Seventy-Six, Silver Dipper mines as well as the veins in Swilling, Carpenter, and Rockwall Gulches. They are of similar character, except that they carry more gold than silver in the Humbug District. They are probably genetically connected with the Tertiary dikes of rhyolite porphyry, which were emplaced just prior to the deposition of the veins.

HUMBUG GOLD PROPERTY

YAVAPAI

I met Dr. Robert Hurt and his father at the Phoenix Mineral Museum at 8:30 AM and rode with them to their Humbug mine in Secs. 1 and 12, T8N, R1W, reached from the Cow Creek trail which branches from the Agua Fria - Castle Hot Springs road. The Humbug mining property presently will support small mine activity and the potential for a medium sized mine is excellent and the possibility for a big mine operation is good. A thorough surface and near surface sampling program is needed, then drilling to determine depth of enrichment. VBD WR 3/12/75

I called Bill Elsing to advise that I was favorable impressed with the Humbug property. I also called Dr. Robert Hurt to advise of favorable impression and to tell him that I had relayed favorable impression to Al Perry whose company is looking for a deposit of gold ore. VBD WR 3/18/75

Dr. Hurt, local dentist, was contacted regarding the Humbug mine. He said he still has an interest in it but that nothing much had been done there for the past 4 mths. due to Newt White having an operation for the removal of a tumor from his lung; it was benign. GW WR 12/1/75

WR GW 9-20-77 = Mr. Larson has been negotiating for a lease on the Humbug property, north of Castle Hot Springs without much success. He has a small mill that he wants to get to working. 9-27-77 bh

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CJH WR 5/13/80: Mr. Mike Korgich, Box 26, Morristown, Arizona 85342, no phone, in office. Holds Humbug Mine and is planning some batch cyanide leaching.

RRB WR 10/21/83: Richard J. and Sallie La Chance, Box 57, Congress, Az. 85332, have the El Perro Bonito (patented) and the Sumner (unpatented) in NE¼, Sec. 12 T8N, R1W for sale. They copied parts of our file and will send prospective buyers in to see the rest of the file.

NJN WR 5/17/85: Robert E. Cohenour, consulting geologist, 1065 East 900 South, Salt Lake City, Utah, 84105, phone 901-363-4684 visited and donated a report on the Humbug Gold Property (f) Yavapai County by Robert Poley that nicely summarizes the regional geology and contains limited sample data.

His letter dated - 1/23/85

January 26, 1985

Mr. W. Scott Donaldson
Platt and Westby, P. C.
Attorneys At Law
2916 North Seventh Avenue, Suite 100
Phoenix, Arizona 85013

Phone 602-277-1441

Dear Mr. Donaldson:

Thank you for your letter concerning the Humbug Mine Lease. We are naturally very sorry to hear that Dr. Hurt has decided not to lease the mine at this time. Our intent was to do a detailed geological evaluation of the property and to conduct a limited drilling program within a 90 to 180 day period in order to obtain accurate data on the quality and quantity of the ore. Then if the numbers indicated it to begin planning for development of the property. The work we planned to do would satisfy the yearly assessment work requirement for 1985.

We hope that you will decide to continue towards development of the mine and will give us a chance to be a part of that endeavor.

Sincerely,

Richard S. Kopp

cc: Mr. Max Peacock

Geo-analytical laboratory
625 NORTH 3RD STREET, SUITE NO. 3, PRESCOTT, AZ 86301 • (602) 778-6048

Robert Poley

Date 8-23-84
Invoice# 02189

Certificate of Analysis

Analytical Method: Pyrometallurgical

sample	Au	Ag	Pt	Pd	Rv	other
HB 25	0.098	0.788	-	-	-	-
HB 26	0.266	13.204	-	-	-	-
HB 27	0.310	1.232	-	-	-	-
HB 28	0.052	0.470	-	-	-	-
HB 29	0.438	0.614	-	-	-	-

Russell D. St. Pierre
Analyst

Charges: $180.00 Paid, Thank you

Geo-analytical laboratory
625 NORTH 3RD STREET, SUITE NO. 3, PRESCOTT, AZ 86301 • (602) 778-6048

Robert Poley

Date 8-23-84
Invoice# 02189

Certificate of Analysis

Analytical Method: Pyrometallurgical

sample	Au	Ag	Pt	Pd	Rv	other
HB 00	0.018	1.552	-	-	-	-
HB 02	0.958	3.232	-	-	-	-
HB 04	ND	5.100	-	-	-	-
HB 07	1.436	2.982	-	-	-	-
HB 08	0.472	1.580	-	-	-	-
HB 09	0.186	2.450	-	-	-	-
HB 10	0.438	11.320	-	-	-	-
HB 14	2.122	0.406	-	-	-	-
HB 15	ND	0.780	-	-	-	-
HB 16	TR	2.080	-	-	-	-
HB 17	0.110	3.930	-	-	-	-
HB 20	0.898	4.220	-	-	-	-
HB 22	0.018	0.704	-	-	-	-
HB 23	3.990	1.886	-	-	-	-
HB 24	0.250	3.986	-	-	-	-

Production: Yes, small amount.
Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2361, p. 5892-5894.

78. Copperopolis Mine
Location: 34°4'46"N, 112°27'47"W
SW1/4 NE1/4 sec. 34, T9N, R2W
Commodities: Cu (major); Pb, Ag (minor)
Ore Materials: Limonite, chrysocolla, galena
Deposit Description: Veins, small, 2 veins, striking N60°W and N70°W and surface and underground workings.
Geology: Veins parallel low angle faults which trend NW, mineralization in Precambrian schists and granite, Tertiary rhyolite. Two ages of mineralization may be present. Older E trending lead veins and younger E trending copper.
Production: Yes, small amount.
References: USGS, 1972, updated 1979, 1981, CRIB Mineral Resources File 12, Record 2362, p. 5895-5897; Stipp et. al., 1967.

79. Maybe Mine
Synonym Name: Foy Group, Foy, Belcher, Maybe Prospect
Location: 34°3'38"N, 112°16'26"W
NW1/4 of NW1/4 sec. 4, SW1/4SW1/4 sec. 5, T8N, R1E
Note: Location estimate is middle of group of shafts in Section 4.
Commodities: Ag (major); W (minor)
Ore Materials: Silver, wolframite, scheelite
Deposit Description: Vein, tabular, pinch and swell, deposit 50 feet in length, 4 feet thick, strikes N30°E, and dips 80°NW. Surface workings.
Geology: Vein system cuts Precambrian quartz monzonite, rhyolite porphyry dikes of Tertiary age are nearby.
Production: Yes, small amount.
Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2307, p. 5730-5732.

80. Humbug Mines
Synonym Name: Acquisition, Mountain Chief, Occident, Fogarty, Queen, Little Annie, Heinie, Lind, and Columbia
Location: 34°2'48"N, 112°18'22"W
Sec. 6,7,18 T8N, R1E,
Sec. 1,12,13 T8N, R1W
(Location is a group location)
Commodities: Au, Ag, Pb, Zn, As; Sb (occurrence)
Ore Materials: Pyrite, galena, sphalerite, arsenopyrite, free gold
Deposit Description: Vein, shear zone, small body, 9000 feet in length, 3 feet in width. Ore body strikes to NE and dips to the NW.

Geology: Mineralization in Precambrian Yavapai schist, pegmatite and granite. Tertiary rhyolite to granite porphyry dikes.
Production: Yes, small amount in 1913.
References: USGS, 1972, updated 1979, CRIB Mineral Resources File 12, Record 2308, p. 5733-5735; Arizona Bureau of Mines, Bull. 180, 1969.

81. Little Joseph Mine
Synonym Name: Little Joe, Acquisition (?), Columbia Gold Mining Property
Location: 34°3'5"N, 112°17'58"W
SE1/4 of NW1/4, sec. 7, T8N, R1E
Commodities: Au, Ag, Cu (major); Pb (minor)
Ore Materials: Gold, auriferous pyrite, and arsenopyrite, chalcopyrite, galena
Deposit Description: Vein, tabular, faulting, shearing, small deposit, 700 feet in length, 400 feet in width, 3 feet thick. Deposit strikes W48°E, and dips 70°-80°NW.
Geology: Host rocks Precambrian quartz monzonite, Tertiary rhyolite porphyry. Veins parallel rhyolite porphyry dikes and foliation in Precambrian xenoliths.
Production: Yes, small amount.
Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2309, p. 5736-5738.

82. Golden Central Mine
Synonym Name: Gold Central
Location: SW1/4 of NW1/4, sec. 7, T8N, R1E
Commodities: Cu, Pb, Au, Ag
Ore Materials: Chalcopyrite, galena, gold, argentiferous galena, unknown copper minerals
Deposit Description: Vein, tabular, small deposit, 2000 feet in length, 50 feet in width, 2 feet thick, and strikes N65°E and dips 75°-80°NW. Underground workings.
Geology: Vein in Precambrian quartz monzonite, Tertiary rhyolite porphyry. Veins parallel phyolite porphyry dikes and foliation in Precambrian xenoliths.
Production: Yes, small amount.
Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2310, p. 5739-5741.

83. Museum Mine
Synonym Name: Museum Group, Silver Museum
Location: 34°3'25"N, 112°16'43"W
NE1/4 sec. 8, T8N, R1E
Commodities: Ag (major); Au, Cu (minor); W (potential)
Ore Materials: Silver, unknown
Deposit Description: Vein, tabular, small with surface and underground workings.

Geology: Vein system cuts Precambrian quartz monzonite, Tertiary rhyolite porphyry dikes occur in area, but are not necessarily coincident with veins.
Production: Yes, small amount.
Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2311, p. 5742-5744.

84. Tom Wade Mine
Synonym Name: 4th of July Group
Location: 34°3'7"N, 112°15'39"W
NE1/4 sec. 9, T8N, R1E
Commodities: Au, Ag (major); Cu, Pb (minor); W (potential)
Ore Materials: Gold, silver, argentiferous galena, unknowns, wolframite
Deposit Description: Vein, tabular, small deposit, strikes N65°E, dips 70° to 80°NW
Geology: Vein system cuts Precambrian quartz monzonite Tertiary rhyolite porphyry dikes occur in district but are not necessariy coincident with veins.
Production: Yes, small amount.
Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2312, p. 5745-5747.

85. Seventy-Six Mine
Synonym Name: 76, Seventy-Six Claim
Location: 34°3'12"N, 112°15'19"W
SE1/4 NE1/4 sec. 9, T8N, R1E
Commodities: Ag, Pb (major); Cu, Au (minor); Zn (potential); W (occurrence)
Ore Materials: Silver, ruby silver, stibnite, gold, galena, chalcopyrite, sphalerite, cerargyrite, prousite
Deposit Description: Vein, tabular, deposit 1000 feet in length, 180 feet in width, 6 feet thick. The ore body strikes N55°-65°E, and dips 70°NE. Underground workings.
Geology: Deposit is quartz vein which parallel to Tertiary rhyolite dikes, both of which cut Precambrian quartz monzonite.
Production: 300 tons from 1936-1940.
References: USGS, 1981, CRIB Mineral Resources File 12, Record 2313, p. 5748-5750; Stipp et. al., 1967.

86. Tip Top Mine
Synonym Name: Conqueror
Location: 34°3'9"N, 112°15'11"W
Sec. 10, T8N, R1E
Commodities: Ag, Au, Pb, Cu, Zn, W, As, Be
Ore Materials: Wolframite, galena, tetrahedrite, arsenopyrite, pyrite, sphalerite, bornite, cerargyrite, ruby silver, gold.

Deposit Description: Vein, Tabular, pinch and swell, 1200 feet in length, 750 feet in width, and 6 feet wide. Ore body strikes N55°E and dips 67°NW. Oxidation goes 200 feet below surface.

Geology: Vein system cuts Precambrian quartz monzonite. Tertiary rhyolite dikes occur in area but are not necessarily coincident with veining.

Production: Yes, small amount.

References: USGS, 1972, updated 1979, 1981, CRIB Mineral Resources File 12, Record 2314, p. 5751-5754; Stipp et. al., 1967; Arizona Bureau of Mines Bull. 180, 1969.

Golden Anchor Mine

Location: 34°1'40"N, 112°17'12"W
NW1/4 sec. 20, T8N, R1E

Commodities: Au, Ag, Pb (major); Cu (minor); Zn (potential)

Deposit Description: Vein, tabular, underground workings.

Geology: Mineralization in Precambrian quartz monzonite and Tertiary rhyolite porphyry.

Production: Yes, small amount.

Reference: USGS, 1981, CRIB Mineral Resources File 12, Record 2315, p. 5755-5757.

Great Cross Cut Prospect

Synonym Name: Pearl Adit, "Glory Hole", Johnson Group

Location: 34°1'N, 112°17'4"W
SW1/4 sec. 20, NW1/4 sec. 29, T8N, R1E

Commodities: W, Ag, Au

Ore Materials: Silver, gold, wolframite, scheelite

Deposit Description: Vein, tabular, pinch and swell. Deposit 3000 feet in length, 100 feet in width, and 3 feet thick. The ore body strikes N10°-25°E and dips 55°-80°W. Surface and underground workings.

Geology: Vein system cuts Precambrian quartz monzonite and schist. Tertiary rhyolite pophyry dikes occur in faults and are coincident with veins.

Production: Yes, small amount.

Reference: USGS, 1972, CRIB Mineral Resources File 12, Record 2316, p. 5758-5761.

Lapan Mine

Synonym Name: Liana Mine, Humbug Mine, Humbug Gold Property, Lind-Fogarty Claims

Location: 34°3'43"N, 112°18'41"W
NW1/4 SE1/4 sec. 1, T8N, R1W

Commodities: Au, Ag, Pb (major); Cu (minor)

Ore Materials: Gold, auriferous pyrite and arsenopyrite, argentiferous galena, chalcopyrite

Deposit Description: Vein, tabular, small deposit 5 feet thick that strikes N60°E and dips steeply to the north.

Geology: Mineralization in Precambrian quartz monzonite and Tertiary rhyolite porphyry.

Production:	Yes, small amount.
References:	USGS, 1981, CRIB Mineral Resources File 12, Record 2317, p. 5762-5764, Stipp et. al., 1967.

El Dorado Mine

Synonym Name:	Security, 4th of July Group
Location:	34°3'2"N, 112°15'53"W SW1/4 sec. 9, T8N, R1W
Commodities:	Ag (major); Pb (potential)
Ore Materials:	Galena, unknowns
Deposit Description:	Vein, tabular, small deposit, 700 feet in length, strikes N65°-70°E and dips steeply to the NW. Underground workings.
Geology:	Vein system cuts Precambrian quartz monzonite. Tertiary rhyolite porphyry dikes occur nearby, but are not necessarily coincident with veins.
Production:	Yes, small amount.
Reference:	USGS, 1981, CRIB Mineral Resources File 12, Record 2318, p. 5765-5767.

El Pero Bonite Mine

Synonym Name:	Mountain Chief Mine, Pero Bonito Mine
Location:	34°3'15"N, 112°18'28"W NE1/4 NE1/4 sec. 12, T8N, R1W
Commodities:	Cu, Ag, Au
Ore Materials:	Chalcopyrite, gold, argentiferous galena, unknown copper minerals
Deposit Description:	Vein, tabular lens, small deposit, 1800 feet in length, 500 feet in width, and 3 feet thick. Ore body strikes N50°E.
Geology:	Vein is in Precambrian quartz monzonite adjacent to rhyolite porphyry dike.
Production:	Yes, small amount.
Reference:	USGS, 1981, CRIB Mineral Resources File 12, Record 2319, p. 5768-5770.

Golconda Mine

Synonym Name:	Golconda Claim
Location:	34°3'23"N, 112°18'27"W NE1/4 NE1/4 sec. 12, T8N, R1W
Commodities:	Au, Ag
Ore Materials:	Gold, auriferous pyrite and arsenopyrite
Deposit Description:	Vein, tabular, small deposit, 1500 feet in length, 50 feet in width and 2 feet thick. Ore body strikes N60°E and dips 75°-80°NW.
Geology:	Mineralization in Precambrian quartz monzonite and Tertiary rhyolite porphyry. Veins parallel rhyolite porphyry dikes and foliation in Precambrian xenoliths.
Production:	Yes, small amount.
Reference:	USGS, 1981, CRIB Mineral Resources File 12, Record 2320, p. 5771-5773.

Columbia

Synonym Name:	Humbug Creek, Humbug District
Location:	34°2'2"N, 112°18'39"W Sec. 13, T8N, R1W
Commodities:	Au (major); Pt (minor)
Ore Materials:	Magnetite, hematite, gold
Deposit Description:	Placer
Geology:	Unknown
Production:	Yes, small amount.
Reference:	USGS, 1975, updated 1979, 1982, CRIB Mineral Resources File 12, Record 2321, p. 5774-5776.

Black Buck Prospect

Location:	34°0'7"N, 112°21'28"W Sec. 27, 34, T8N, R1W
Commodity:	Mn
Ore Materials:	Manganese oxides
Deposit Description:	Veins, shear zone, lenticular, small deposit, 600 feet in length, 6 feet in width, and strikes NW. Underground workings.
Geology:	Host rock Precambrian granite
Production:	Yes, small amount.
References:	USGS, 1979, CRIB Mineral Resources File 12, Record 2322, p. 5777-5778; Stipp et. al., 1967; Arizona Bureau of Mines Bull. 180, 1969.

Kay Copper Mine

Location:	34°3'37"N, 112°9'35"W SE1/4 SW1/4 sec. 4, NW of NE and NW1/4 sec. 9, T8N, R2E
Commodities:	Cu, Pb, Ag (major); Au (minor); Zn (potential)
Ore Materials:	Chalcopyrite, galena, auriferous pyrite, sphalerite, tetrahedrite
Deposit Description:	Stratiform massive sulfide, lense shaped, 2 ore bodies, reserve estimates vary from 180,000 tons to 1,400,000 tons. Underground workings.
Geology:	Host rocks Precambrian metarhyolite, metaandesite, quartz-mica schist.
Production:	Yes, small amount.
References:	USGS, 1981, CRIB Mineral Resources File 12, Record 2323, p. 5779-5782; Anderson and Guilbert, 1979.

Whipshaw Mine

Location:	34°2'49"N, 112°28'49"W Sec. 3, T8N, R2W
Commodities:	Au, Cu (major); Ag (minor)
Ore Materials:	Chrysocolla, gold, specularite
Deposit Description:	Small vein deposit, 4 feet in width, and strikes NW, dips to SW. Underground workings.
Geology:	Deposit is quartz vein localized along low angl fault in Tertiary rhydite and Precambrian quartz mica schist and amphibole schist.

SAMPLE NO.: HB-01

DATE: July 2

U.T.M. COORDS. E.: N.:

MAP NAME: Columbia - Humbug - Jack

MAP LOC. NO.: 01 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) [illegible] zone [illegible]

ROCK TYPE: CRQM - Mod. Pegmatitic host w/ fault breccia - fragments Angular to sub-rounded fragments.

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Breccia zone -

PERV. ALT.: (NIL, WK., MOD., ST.) WK. silicification

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER) Mineralized breccia zone, strong hematitic and limonitic matrix. Slightly altered clasts WK chl. WK. ser.

THICKNESS: 2"-12" ATTITUDE: N34W 40NE

ORE - GANGUE - WALL RK. RATIO: 10-5-85

OXIDE - SULFIDE RATIO: 100-0

ORE MINERALOGY + ABUND.: Hematite - Limonite matrix, fine pore gossan possibly filled. Matrix fairly well cemented.

GANGUE MIN. + ABUND.:

DESCRIPTION OF MIN.:

SAMPLE NO.: HB-00

DATE: July 26

U.T.M. COORDS. E.: N.:

MAP NAME: Columbia - Humbug - Apex

MAP LOC. NO.: 00 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) 1-2 tons on dump, vein well exposed

ROCK TYPE: Silicified & mineralized vein cutting medium grained quartz - monz.

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Vein - silicified with oxides and sulfides

PERV. ALT.: (NIL, WK., MOD., ST.) WK. Alteration past hanging and foot wall, WK-MOD si, WK ser. - FeOXHL - Mod. Perv.

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER) Semi-massive, WK to mod brecciation, Gossan pockets & xl. lined vugs, strong hem. stain.

THICKNESS: 6-12" ATTITUDE: N30E 72NW

ORE - GANGUE - WALL RK. RATIO: 5-95-0 Specularite, Hematite, Limonite, jarosite

OXIDE - SULFIDE RATIO: 90-10 hematite

ORE MINERALOGY + ABUND.: Hematite - specularite vein and fracture fillings. Heavy stain scattered zone of sulfides

GANGUE MIN. + ABUND.: Vuggy seams with specularite hematite coatings over quartz druzy xls.

DESCRIPTION OF MIN.: Xl plates & coatings of specularite

Ag 1.552

Au .018

SAMPLE NO.: HB-02

DATE: July 2

U.T.M. COORDS. E.: N.:

MAP NAME: Columbia - Humbug - Jack

MAP LOC. NO.: 02 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.)

ROCK TYPE: CRQM med grained [illegible]

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Qtz. Vein.

PERV. ALT.: (NIL, WK., MOD., ST.) Ø

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER) Semi massive semi honeycomb med bxut Strong Hematite [illegible] Limonite stain Scattered [illegible]

THICKNESS: 4-6"? ATTITUDE: N30E 78NW

ORE - GANGUE - WALL RK. RATIO: 5-95-0

OXIDE - SULFIDE RATIO: 95-5

ORE MINERALOGY + ABUND.: [illegible] and cube of Argentite [illegible]

GANGUE MIN. + ABUND.: Quartz Vein [illegible] semi massive semi honeycomb [illegible] Semi - [illegible]

DESCRIPTION OF MIN.: [illegible]

Ag - 3.232

Au - .958

SAMPLE NO.: HB-03

DATE: July U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Hornet

MAP LOC. NO.: 03 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, **DUMP**, IN-PLACE MIN.)

ROCK TYPE: CBQM - Peg - Mod - Silicification
Weak FeOXLH stain

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized Qtz vein

PERV. ALT.: (NIL, WK., MOD., ST.) Mod Silicification

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
brecciated qtz vein with gossan pockets, Xl lined cavities host for mineralizing fluids.

THICKNESS: 2-6" ATTITUDE: N/A

ORE - GANGUE - WALL RK. RATIO: 10-60-30

OXIDE - SULFIDE RATIO: 100-0

ORE MINERALOGY + ABUND.: Limonite-Hematite medium pore gossan, up to 1cm x 3cm masses

GANGUE MIN. + ABUND.: Semi Comb qtz vein Xl lined cavities slight si gossan walls
Some moderately silicified FeOXHL

DESCRIPTION OF MIN.:

SAMPLE NO.: HB-04

DATE: July U.T.M. COORDS. E.: N.:

MAP NAME:

MAP LOC. NO.: SAMPLER:

SAMPLE TYPE: (ROCK, **DUMP**, IN-PLACE MIN.) 4-6 tons
Caved Adit

ROCK TYPE: CBQM - medium grained - fi...
fairly massive & competent
basically unaltered

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized Quartz Vein

PERV. ALT.: (NIL, WK., MOD., ST.) Mod Si

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Semibanded qtz vein stringers of box... filled. Pore gossan, Xl lined vugs with mineralized fillings

THICKNESS: 8"-12" ATTITUDE: N80E 69NW

ORE - GANGUE - WALL RK. RATIO: 10-85-5

OXIDE - SULFIDE RATIO: 90-10 FeOXLH-pyrite-galena Arsenopyrite

ORE MINERALOGY + ABUND.: FeOXL-H boxwork and stain pyrite 70-30 galena APY in un-ox sample

GANGUE MIN. + ABUND.: Semi transparent quartz Xl lined vugs brecciated & mineralized fine accicular Xls

DESCRIPTION OF MIN.:
Ag - 5.10
Au - 0 -

SAMPLE NO.: HB 05

DATE: July U.T.M. COORDS. E.: N.:

MAP NAME: Columbia - Humbug - Newt

MAP LOC. NO.: 05 SAMPLER:

SAMPLE TYPE: (ROCK, DUMP, **IN-PLACE MIN.**) 4' cut
across mineralized zone

ROCK TYPE: Altered zone? north of massive barren quartz vein [Felsic (Avadai Schist)]
Muscovite ... Schist

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Felsic Volcanic Protolith?

PERV. ALT.: (NIL, WK., MOD., ST.) Strong Hematite limonite stain; Mod Sericite? Wk Argillic?

MIN. OCCUR: (DISCREET VN., **DIFFUSE VN.**, SKARN, **REPLACEMENT**, STOCKWORK-DISSEMINATED, **OTHER**)
Hematite indurated Felsic Schist
Hematite coatings and possible replacement of selectively altered unit of felsic Schist

THICKNESS: 3-6' ATTITUDE: N55E 79NW

ORE - GANGUE - WALL RK. RATIO: 3-17-80

OXIDE - SULFIDE RATIO: 100-0 Fairly well banded possibly retrograde muscovite

ORE MINERALOGY + ABUND.: Indurated FeOXH stain

GANGUE MIN. + ABUND.: Ø Silicification

DESCRIPTION OF MIN.:

SAMPLE NO.: HB-06

DATE: July U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Hu[illegible] [illegible]

MAP LOC. NO.: 06 SAMPLER: [illegible]

SAMPLE TYPE: (ROCK, **DUMP**, IN-PLACE MIN.) 2-3 tons 8 separate piles Dump well oxidized

ROCK TYPE: CBQM Por- Fine grained Hang wall semi-foliated

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized qtz. vein

PERV. ALT.: (NIL, WK., MOD., ST.) WK sericitic host WK si At contact

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Semibanded - massive - slightly brecciated rehealed - Abundant bugholes, gossan Mg-Mn stain mod. FeOXLH

THICKNESS: 12" ATTITUDE: N72E 67 NW 72

ORE - GANGUE - WALL RK. RATIO: 7-70½-23

OXIDE - SULFIDE RATIO: 85-15 limonite & hematite - pyrite 80-20 galena

ORE MINERALOGY + ABUND.: Scattered masses pockets and stringers of pyrite with silica honey combs

GANGUE MIN. + ABUND.: Sugary granular vein brecciated & rehealed

DESCRIPTION OF MIN.: Sample of sulfide material not rep. of dump as a whole

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SAMPLE NO.: HB-07

DATE: July U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug -Queen

MAP LOC. NO.: 07 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, **IN-PLACE MIN.**) Channel cut

ROCK TYPE: CBQM host slightly pegmatitic YAV Series (intermed) Adj. to FTWALL Across vein in caved shaft on road

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz vein Massive vein with fine grained feldspar Hang wall.

PERV. ALT.: (NIL, WK., MOD., ST.) WK perv. si. Mod Ser. St. Si in vein fine grain Hang wall & some ftwall mod. sericitization

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Well defined hang & footwall, Weak Fe Stain in host, mod sericitization vein: scattered masses of sulfides with banding also common. Black sulfides with pyrite

THICKNESS: 12-18" ATTITUDE: N6DE 73 NW

ORE - GANGUE - WALL RK. RATIO: 5-90-5

OXIDE - SULFIDE RATIO: 80-20

ORE MINERALOGY + ABUND.: Limonite & Hematite gossan coatings and fracture fillings - pyrite - galena veinlets & scattered masses

GANGUE MIN. + ABUND.: Semi massive granular quartz vein masses and sub parallel zone of mineralization in xl lined solution cavities

DESCRIPTION OF MIN.: Garnet coatings in fractures adjacent to vein.

Ag - 2.982

Au - 1.43

SAMPLE NO.: HB-08

DATE: July Fr. U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug -

MAP LOC. NO.: 08 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, **DUMP**, IN-PLACE MIN.) Caved adit on east side of wash with small pile of ore

ROCK TYPE: Fine and med grained CBQM

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized qtz vein paper thin oxidized bands

PERV. ALT.: (NIL, WK., MOD., ST.) Weak to Mod perv. silicification near contacts

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Dense Massive vein material with pockets of oxidized sulfides

THICKNESS: 4-12" ATTITUDE: N42E 82 NW

ORE - GANGUE - WALL RK. RATIO: 15-85

OXIDE - SULFIDE RATIO: 100-0

ORE MINERALOGY + ABUND.: Re silicified limonite massive & gossan in quartz vein breccia coatings & solution fillings

GANGUE MIN. + ABUND.: Semi massive brecciated and rehealed qtz vein solution cavities Silicified gossan, random xl ath matrix

DESCRIPTION OF MIN.: Slight CuOx stain

Ag - 1.58

Au - .472

SAMPLE HB-09

DATE: July 31 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Sidewinder [illegible]

MAP LOC. NO.: 09 SAMPLER: R. Foley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) [illegible]
#2 Adit SW [illegible]

ROCK TYPE: CBQM [illegible]
well brecciated, [illegible] FeOXLH stain
mod Potassic-Sericitic-Argillic

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) Potassic-Sericitic
Argillic 2ndary Muscovite?

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER)
Massive & compact qtz vein pinches & swells, brecciated & healed FeOXL in fractures
Host altd. at contact, Galena Pyrite Sulfides

THICKNESS: 3" ATTITUDE: N28E 78NW

ORE - GANGUE - WALL RK. RATIO: 10-70-20

OXIDE - SULFIDE RATIO: 40-60

ORE MINERALOGY + ABUND.: Galena stringers, masses and cubes 7<-25 pyrite stringers and cubes, limonite gossan & stain

GANGUE MIN. + ABUND.: Massive quartz vein
∅ silicification of host

DESCRIPTION OF MIN.:
Ag - 2.45
Au - .186

SAMPLE NO.: HB-10

DATE: July [illegible] U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-[illegible] N [illegible]

MAP LOC. NO.: 10 SAMPLER: R. Foley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) [illegible]

ROCK TYPE: [illegible] CBQM wk-[illegible]
mod. Potassic-[illegible] Argillic [illegible]
[illegible] fine gr. Alteration

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
[illegible]

PERV. ALT.: (NIL, WK., MOD., ST.) [illegible] mod potassic [illegible]
[illegible] [wk [illegible]]

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER)
[illegible] vein, semibrecciated, infilled with [illegible] massive semi metallic oxide, [illegible] stockwork [veinlets]

THICKNESS: 4-6"? ATTITUDE:

ORE - GANGUE - WALL RK. RATIO: 10-80-10
gossan strongly hematitic - limonitic

OXIDE - SULFIDE RATIO: 85-15

ORE MINERALOGY + ABUND.: Grey metallic sulfide
Heavy semimetallic hematite semi gossan

GANGUE MIN. + ABUND.: WK to mod silicified vein

DESCRIPTION OF MIN.: wk-tr Cu stain
Galena? Stain mineralization and gossan resemble silver zones west of Tiptop Mine
Ag - 11.32 Au - .438

SAMPLE NO.: HB-11

DATE: July 31 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Sidewinder

MAP LOC. NO.: 11 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Cut 10"
Across [illegible] N side RKWHt

ROCK TYPE: Fine to coarse gr. CBQM, mod. potassic-sericitic [illegible] mod breccia
[illegible] mod pot-ser, FeOXL mod

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) Mod potassic-sericitic
[illegible] wk-mod Argillic

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER)
Massive [illegible] qtz vein scattered
[illegible] of pyrite and grey sulfide semi banded in outcrop
altered and [illegible]

THICKNESS: 10" ATTITUDE: N47E 51NW

ORE - GANGUE - WALL RK. RATIO: 5-90-5

OXIDE - SULFIDE RATIO: 50-50

ORE MINERALOGY + ABUND.: FeOXLH massive pockets & veinlets [illegible]
grey sulfides in [illegible] silicified zones

GANGUE MIN. + ABUND.: Massive compact grainy quartz vein - xline [illegible]

DESCRIPTION OF MIN.:

Feldspar-Qtz Dike

SAMPLE NO.: HB-12

DATE: July 31 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Sidewinder

MAP LOC. NO.: 12 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, **DUMP**, IN-PLACE MIN.) Sample of sulfide rich material from ore pile?

ROCK TYPE: See HB 11

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) St. Seritization?

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Sulfide and oxide rich fractured qtz vn. Pyrite masses stringers pockets, limonite after pyrite as masses coatings and trace of gossan,

THICKNESS: 6-10"? ATTITUDE: N/A

ORE - GANGUE - WALL RK. RATIO: 8-92-0

OXIDE - SULFIDE RATIO: 20-80

ORE MINERALOGY + ABUND.: Pyrite masses stringers and cubes with grey metallic sulfide,

GANGUE MIN. + ABUND.: Massive competent "grainy" quartz vein scattered solution cavities & xl pockets

DESCRIPTION OF MIN.:

SAMPLE NO.: HB-13

DATE: Aug 15 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Jessie

MAP LOC. NO.: 13 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, **IN-PLACE MIN**) N10W Vert 10" wide cut on silicified massive Qtz. vein

ROCK TYPE: Pred. Coarse to Med. grained CBQM
N50W 45SW Shear Zones Budins
mChl Zenos? M Ser

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized Qtz vein cut above assay office.

PERV. ALT.: (NIL, WK., MOD., ST.) Zenoliths: mChl, mSer
Ø-wk Si CBQM

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Sugary quartz xl aggregate with dissem. limonite pockets and filled cavities some which have cubic shapes? dike like contacts - but cover obscures trace.

THICKNESS: 10" ATTITUDE: N10W Vert

ORE - GANGUE - WALL RK. RATIO: 3-60-37

Probably not vein cut goes in on.

OXIDE - SULFIDE RATIO: 100-0

ORE MINERALOGY + ABUND.: very small but abundant disseminated limonite masses, limonite stain

GANGUE MIN. + ABUND.: Aggregate of quartz or possibly feldspar or barite

DESCRIPTION OF MIN.: Vein aggregate of milk-white-pinkish which good div cleavage? looks like orthoclase but cleavage like barite grain 1mm → 6mm

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On Road to Placer Operation

SAMPLE NO.: HB-14

DATE: Aug. 2 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Jessie

MAP LOC. NO.: 14 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, **IN-PLACE MIN**) Along 4ft of swell in vein 2-4" thick

ROCK TYPE: Med to fine gr hangwall, coarse peg. footwall mod Si ftwall CBQM in pred. pegmatitic zone

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized Quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.)
Mod. Silicification in footwall

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Mineralized qtz vein in pegmatitic CBQM, Mod Seratization 1x fault plane on vein contact with host, Masses & seams FeOX gossan

THICKNESS: 2-4" ATTITUDE: N60E 44NW

ORE - GANGUE - WALL RK. RATIO: 10-70-20

OXIDE - SULFIDE RATIO: 100-0

ORE MINERALOGY + ABUND.: limonite-hematite gossan coatings masses seams and stains after sulfides (pyrite)

GANGUE MIN. + ABUND.: Qtz vein banded to brecciated granular - massive - combstr. xl lined vugs

DESCRIPTION OF MIN.:
Ag - .406
Au - 2.122

SAMPLE NO.: HB-15

DATE: Aug 2 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Wasp adit

MAP LOC. NO.: 15 SAMPLER: R Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Oxidized dump and vein material 50-50 Select

ROCK TYPE: Med-Coarse-Fine CBQM. St. Ser M Arg. M Potassic Semi brecciated friable on footwall of vein

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz Veins

PERV. ALT.: (NIL, WK., MOD., ST.) St Ser M Arg M Pot, on footwall. Ser Ar M Hang

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) 2-3 foot massive quartz vein interlocking crystal matrix resilicified scattered sulfides Altd to limonite

THICKNESS: 2-3' ATTITUDE: N78E 66NW

ORE-GANGUE-WALL RK. RATIO: 5-90-5

OXIDE-SULFIDE RATIO: 100-0

ORE MINERALOGY + ABUND.: limonite stain strong scattered limonite gossan between crystal laths. Not strongly mineralized

GANGUE MIN. + ABUND.: Coarsly granular aggregate of quartz laths, Semi massive some vugs

DESCRIPTION OF MIN.:

Ag .78

Au -0-

SAMPLE NO.: HB-16

DATE: Aug 2 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-[illegible]

MAP LOC. NO.: 16 SAMPLER: R Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) [illegible]

ROCK TYPE: CBQM Mod-coarse grained host with [illegible] Yav. Series [illegible] vein. Indurated Altered schist St. FeOXL stain

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) Mod-st Sericite after spars granitic host. Mod Si hangwall

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Semi banded qtz vein gossanous core of vein indurated schist host. Strong sericite bound by Altd schist Strong limonite stain. Hangwall Mod Si

THICKNESS: 16" ATTITUDE: E-W 46NW

ORE-GANGUE-WALL RK. RATIO: 5-75-20

OXIDE-SULFIDE RATIO: 100-0

limonite stain semi-empty boxwork cavities

ORE MINERALOGY + ABUND.: Mod-st limonite stain Small to med pore bxwk after pyrite? Most oxides removed empty casts

GANGUE MIN. + ABUND.: Spongy quartz vein crystal aggregate - semi comb very porous xllined vugs

DESCRIPTION OF MIN.:

Ag - 2.08

Au - Trace

SAMPLE NO.: HB-17

DATE: Aug 2 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Llano

MAP LOC. NO.: 17 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) 8" cut across back at portal of lowest tunnel

ROCK TYPE: Hangwall altd Rhyo Porph. Dike. Ftwall Altd Mod chl. ser. pot. wk Arg. Sheared ftwll @ contact

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)

PERV. ALT.: (NIL, WK., MOD., ST.) Ftwll: st ser pot M.

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Rhyolite porphyry dike hangwall clean unaltd contact wk dulling, Alt. to feldspars slight greenish tint to matrix. Ftwll sheared sericite & fairly flat Yav. Ser. Int Comp

THICKNESS: 6-8" ATTITUDE: N47E 84SE

ORE-GANGUE-WALL RK. RATIO: 20-80-0

OXIDE-SULFIDE RATIO: 80-20

limonite-Hematite seam & cavity fillings after pyrite, strong FeOXLH stain

ORE MINERALOGY + ABUND.: Hairline seams and pockets of limonite med-fine [illegible] gossan limonite, massive and grains of pyrite

GANGUE MIN. + ABUND.: granular qtz vein banded [illegible] comb structures xl lined cavities

DESCRIPTION OF MIN.: Dike fairly massive & blocky, heavy fe stain on surface large Yav fragments 3-10" altd footwall

Ag - 3.93 Au - .11

SAMPLE NO.: HB-18

DATE: Aug 2

U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-[illegible]-Jack

MAP LOC. NO.: 18 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Grab sample of sulfide rich qtz vein on middle dump

ROCK TYPE: [illegible] Fairly unaltered, footwall brecciated mod-st FeOXLH stain

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) St. granular Alt. Mod ser m pot wkchl [qtz ser pyr] pod

MIN. OCCUR.: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER) [Granular Hem-[illegible]] Semibanded qtz vein masses and subparallel seams of pyrite, Xl lined cavities and some druzy coatings over sulfides, relect random comb-structure

THICKNESS: 2' ATTITUDE: N/A?

ORE - GANGUE - WALL RK. RATIO: 15-75-10

OXIDE - SULFIDE RATIO: 30-70 limonite stain coatings, siFeOXL in some vugs, seams oxidized

ORE MINERALOGY + ABUND.: Masses veinlets seams and scattered pyrite cubes altering to limonite. some silicous limonite, grey metallic sulfide

GANGUE MIN. + ABUND.: Semi massive qtz. vein banded granular xl lined cavities & random comb str with 2ndary druzy over sulfides

DESCRIPTION OF MIN.:

SAMPLE NO.: HB-19

DATE: Aug

U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Comet

MAP LOC. NO.: 19 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Dump

ROCK TYPE: Med-coarse fine gr CBQM Altd zeno ser M-Along contact. Slight brecciation, mod FeOXL stain

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz Vein

PERV. ALT.: (NIL, WK., MOD., ST.) Mod. seritization [illegible] wk potassic

MIN. OCCUR.: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER) Mineralized quartz vein cutting CBQM with altd xenolith of Yav. series in comp. in the fault zone.

THICKNESS: 4-6"? ATTITUDE: N37E 47NW

ORE - GANGUE - WALL RK. RATIO: 10-90-0

OXIDE - SULFIDE RATIO: 5-95

ORE MINERALOGY + ABUND.: Arsenic Sulfide?

GANGUE MIN. + ABUND.: Massive competent vein of Xl Aggregate random comb str. glass

DESCRIPTION OF MIN.: Grey black metallic sulfide masses with hackly irregular fracture. Pyrite masses and stringers

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SAMPLE NO.: HB-20

DATE: Aug 3

U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Comet

MAP LOC. NO.: 20 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Cut across 1' vein above adit on Comet

ROCK TYPE: fine-coarse grained CBQM w altd Yav. sandwich around vein

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz Vein

PERV. ALT.: (NIL, WK., MOD., ST.) M.Ser. Wk Arg. FeOXLH granular M. Pot?

MIN. OCCUR.: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK, DISSEMINATED, OTHER) Semi banded semi massive mineralized quartz vein brecciated in places. pinches and swells, mostly oxidized, mineralized matrix strong FeOXL stain

THICKNESS: 4"-12" ATTITUDE: N34E 89SE

ORE - GANGUE - WALL RK. RATIO: 10-75-5

OXIDE - SULFIDE RATIO: [80-20] Breccia 100-0 Qtz nodules 20-80 with bxwk.

ORE MINERALOGY + ABUND.: Limonite matrix stain gossan silvery grey sulfides masses pyrite masses and stringers

GANGUE MIN. + ABUND.: Angular qtz breccia frags wk si matrix Massive compent quartz nodules

DESCRIPTION OF MIN.:
Ag - 1.576
Au - .898

SAMPLE NO.: HB-21

DATE: Aug 3 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Jim

MAP LOC. NO.: HB-21 SAMPLER: R. Poley Jr.

SAMPLE TYPE: (ROCK, DUMP, **IN-PLACE MIN.**) 5" cut
West in Adit
Across mineralized vein above adit

ROCK TYPE: Fine and med gr CBQM Host
perv. Kaolin-potassic on feldspars to
flat white crumbly particles with slightly
grainy texture

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized quartz vein in CBQM

PERV. ALT.: (NIL, WK., MOD., ST.) Mod ser (Mod si?)
2ndary Biotite?

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
5' si zone ftwall ser brec fine gr CBQM
Hang perv ser FeOXL semi granular
breccia

THICKNESS: 4-8" ATTITUDE: N33E 83NW

ORE - GANGUE - WALL RK. RATIO: 10-80-0

OXIDE - SULFIDE RATIO: 80-20

ORE MINERALOGY + ABUND.: Scattered pyrite masses
and stringers Altd to hematite and
limonite in veinlets of healed breccia

GANGUE MIN. + ABUND.: Grainy massive vein
cut by scattered pyrite masses

DESCRIPTION OF MIN.:

SAMPLE NO.: HB-22

DATE: Aug U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Jim?

MAP LOC. NO.: 22 SAMPLER:

SAMPLE TYPE: (ROCK, DUMP, **IN-PLACE MIN.**) 12" cut
Across vein where [illegible] qtz vein

~~ROCK TYPE:~~ Exposed to left.
Sericitized and brecciated fine-med CBQM
and silicified in places w/ FeOXLHJ

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized Quartz Vein

PERV. ALT.: (NIL, WK., MOD., ST.) SHWall feldspars -> Pot.
Mod Si in places 2ndary biotite?

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Initial subgranular facies is med-fine gr CBQM
mchl ms: Jm FeO impregnation Brecciated.
Footwall semifoliated hem -> limonite
Hangwall Mod ser mod scattered Si; Mod FeOX

THICKNESS: 12" ATTITUDE: N43E 77NW

ORE - GANGUE - WALL RK. RATIO: 10-90-0

OXIDE - SULFIDE RATIO: 50-50

ORE MINERALOGY + ABUND.: FeOXHLJ Grey metallic sulfide
grains and masses w/ pyrite grains and
masses limonite gossan & stain hematite to

GANGUE MIN. + ABUND.: Sugary qtz vein with
some remnant random comb str.
not real massive or competent

DESCRIPTION OF MIN.:
Ag - .704
Au - .018

SAMPLE NO.: HB-23

DATE: Aug 3 U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Joker

MAP LOC. NO.: 23 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, **DUMP**, IN-PLACE MIN.) Caved
Adit with small orepile on dump

ROCK TYPE: CBQM med gr hangwall.
Footwall slightly Altd & silicified CBQM
directly adjacent to Rhyolite Porphyry Dike

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.)
Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) Silicified footwall
Wk grainy crumbly dull white feldspars hangwall

MIN. OCCUR: (**DISCREET VN.**, DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Masses & veinlets of weakly oxidized pyrite and
grey metallic sulfides in semibanded quartz
vein strong FeOXLHJ stain Xl lined vugs

THICKNESS: 4-8" ATTITUDE: N51E 84NW

ORE - GANGUE - WALL RK. RATIO: 10-90-0

OXIDE - SULFIDE RATIO: 10-90

ORE MINERALOGY + ABUND.: Masses of pyrite in qtz
vein, minor grey metallic sulfides
limonite hematite stain, gossan coatings

GANGUE MIN. + ABUND.: Massive sulfide with qtz vein
granular with relict comb str. some druze
Xl lined vugs and cavities

DESCRIPTION OF MIN.:
Ag - 1.0
Au - 3.99

SAMPLE NO.: HB-24

DATE: Aug 4th U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Winde T

MAP LOC. NO.: 24 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, (IN-PLACE MIN)) Cut Across 3 foot wide mineralized RPD.

ROCK TYPE: Rhyolite Porphyry Dike Stockwork disseminated, mineralization

TYPE UNIT: (SED., FLOW, TUFF, (DIKE) SILL, LACH, PLUG, BATH.) Mineralized RPD mod brecciation

PERV. ALT.: (NIL, WK., MOD., ST.) Mod Si Mod Ser Quartz pyrite sericite

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Mineralized dike on ftwall of 6ft si M. but unmineralized RPD dark FeOXL stain And well altd appearance fairly massive

THICKNESS: 3' ATTITUDE: N45E 68NW

ORE - GANGUE - WALL RK. RATIO: 3-27-70

OXIDE - SULFIDE RATIO: 50-50

ORE MINERALOGY + ABUND.: Pyrite Seams veinlets disseminated cubes

GANGUE MIN. + ABUND.: Stockwork-diss. Qtz veinlet 1-2 mm st FeOXL Halos Mod si coarse CBQM Ftwall MFeOXH

DESCRIPTION OF MIN.: Pyrite in fractures and stringers As well As → 2 mm cubes

Ag - 3.586

Au - .250

SAMPLE NO.: HB-25

DATE: Aug U.T.M. COORDS. E.: HB23A N.:

MAP NAME: Columbia-Humbug-LADANN

MAP LOC. NO.: 25 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, (IN-PLACE MIN)) Cut Across 2½ feet of brecciated mineralized qtz vein.

ROCK TYPE: Hangwall CBQM Med-coarse grain well brecciated Weakly silicified Weak seritization Strong limonite stain

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) YAV. Serics Footwall: WK Chl; Wk-Mod Ser. Hgwll: CBQM: WK ser WK: si

MIN. OCCUR: ((DISCREET VN), DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Hangwall brecciated & stained 10 ft above vein. Vein strong limonite stain coatings YAV Schist Footwall punky granular altd

THICKNESS: 2-3' ATTITUDE: N54E 78NW

ORE - GANGUE - WALL RK. RATIO: 5-90-5

OXIDE - SULFIDE RATIO: 100-0 limonite stain gossan & fracture fillings, disseminated cubes with traces of limonite

ORE MINERALOGY + ABUND.: gossan and cavities limonite filled

GANGUE MIN. + ABUND.: Boxworked And vug filled quartz vein, xl lined pockets,

DESCRIPTION OF MIN.:

~~Z~~ Ag - .788

Au .098

Cu-Next to Dike

SAMPLE NO.: HB-26

DATE: Aug 9 U.T.M. COORDS. E.: N.: ~~GOLDEN~~

MAP NAME: Columbia-Humbug-Queen

MAP LOC. NO.: 26 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, (DUMP) IN-PLACE MIN.) 2-6" vein material massive with CuOX-massive hematite

ROCK TYPE: CBQM Mod brecciated Fine gr hang wall gritty spars punky ftwall coarse mod si on slick gritty spars underneath

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) 2nd adit up from creek. Mineralized Quartz vein.

PERV. ALT.: (NIL, WK., MOD., ST.) St Si ftwll. CBQM Dg

MIN. OCCUR: ((DISCREET VN.) DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) RPD ad, Ftwll 3-20ft Mod si Med grained not large phenos Hematite & limonite gossan Massive silicic FeCuOx filling xl lined fractures

THICKNESS: 4-8" ATTITUDE: N78E 63NW

ORE - GANGUE - WALL RK. RATIO: 25-75-0

OXIDE - SULFIDE RATIO: 85-15

ORE MINERALOGY + ABUND.: Copper sulfide? Altd to CuFeOXHL Massive hematite & limonite Malachite after bluish metallic brittle CuS

GANGUE MIN. + ABUND.: Coarsly xline vuggy qtz same fairly massive, silicification of oxides

DESCRIPTION OF MIN.: Bright brochantite like green bloom & coatings in And under footwall in Altd. CBQM

Ag - 13.204

Au - .266

SAMPLE NO.: HB-27

DATE: Aug 9th U.T.M. COORDS E.: N.:

MAP NAME: Columbia-Humbug-Bug

MAP LOC. NO.: 27 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Sample of ore pile on dump 5 tons? middle Adit?

ROCK TYPE: CBQM Well brecciated, ftwall sheared & si mod 6-12" striated hangwall slickensides

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) St. crumbly gritty feldspar alteration creamy white St. hang aft

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Massive semi banded - banded vugs & xline pockets coated with FeOXLH
Narrow bands and scattered pockets of ox sulfides some parts of vein brecciated → healed

THICKNESS: 4-6"-12" ATTITUDE: N79E 77NW

ORE-GANGUE-WALL RK. RATIO: 10-85-50

OXIDE-SULFIDE RATIO: 50-50 pyrite galena: masses of massive hematite & limonite gossan & stain

ORE MINERALOGY + ABUND.: Masses and stringers of pyrite with accessory galena. Hematite masses in limonite gossan med pore hematite & limonite

GANGUE MIN. + ABUND.: Massive granular quartz some xl lined vugs & cavities with ore in cavities

DESCRIPTION OF MIN.:

Ag 1.232

Au -.31

SAMPLE NO.: HB-28

DATE: Aug 9th U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Bob

MAP LOC. NO.: 28 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) 10 ton ore pile on dump, bottom adit on large vein

ROCK TYPE: Med grained CBQM host Rhyolite porph. dike 6-7ft to south

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz vein Strong oxide stain, mineralized breccia zone

PERV. ALT.: (NIL, WK., MOD., ST.) Mod silicification; Strong limonite MnOx stain; Mod sericitization

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
1ft altd st si st Mn stain ftwall bothwalls mod ser-crumbly
Dike 60ft SE of ftwall YAV. slivers

THICKNESS: 6-18" ATTITUDE: N75E 76NE

ORE-GANGUE-WALL RK. RATIO: 10-80-10

OXIDE-SULFIDE RATIO: 100-0 hematite-limon.

ORE MINERALOGY + ABUND.: Random thin seams and small scattered pockets of hematite mod hematite & limonite coatings

GANGUE MIN. + ABUND.: Massive qtz vein, portions brecciated healed with silic & mineralized cement

DESCRIPTION OF MIN.: N31W 72SW Mineralized breccia zone fault
Flourite? brown-orange octahedral 1mm euhedral crystals translucent

SAMPLE NO.: HB-29

DATE: Aug 9th U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Crescent

MAP LOC. NO.: 29 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) 1/4 ton ore pile on dump

ROCK TYPE: CBQM-Med grained Mod FeOxL Mod. Brecciation. Mod. Chl. Propolitic wk Argillic. Pods of Ser. Altd Med. Comp. YAV.

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz vein

PERV. ALT.: (NIL, WK., MOD., ST.) Mod. Seritization of CBQM and YAV. Series Pods

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER)
Open cavity center of vein solutioning
Crystalline pockets filled with gossan and oxidized sulfides Mostly limonite

THICKNESS: 4-8" ATTITUDE: E-W 62 NW

ORE-GANGUE-WALL RK. RATIO: 15-85-0

OXIDE-SULFIDE RATIO: 90-10 FeOXLH-pyrite

ORE MINERALOGY + ABUND.: limonite gossan & coatings scattered pyrite cubes & masses in st. si zones hematite stain

GANGUE MIN. + ABUND.: Solution cavities xllined very abundant reminant random comb-structure.

DESCRIPTION OF MIN.: Most gossan in sample has weathered out, low assay?

Ag .614

Au .438

SAMPLE NO.: HB-30

DATE: Aug 10th U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-Crescent Patd.

MAP LOC. NO.: 30 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) 4' channel of vein material along vein above tunnel.

ROCK TYPE: CBQM Pegmatitic Semi foliated Massive Competent Well Silicified

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Mineralized Quartz Vein in CBQM-Peg

PERV. ALT.: (NIL, WK., MOD., ST.) WK-Mod Si Mod-St FeOXL Mod MnOx haloe

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Sulfide rich quartz vein cutting CBQM Some brecciation of vein along hangwall contact MnOx halo 1' wide across vein. Stronger stain on hang wall side Well si host

THICKNESS: 4-12" ATTITUDE: N51E 74NW

ORE - GANGUE - WALL RK. RATIO: 15-80-5

OXIDE - SULFIDE RATIO: 40-60 limonite:pyrite

ORE MINERALOGY + ABUND.: Masses of pyrite altering to limonite, med pore gossan

GANGUE MIN. + ABUND.: Xline med vugyy qtz vein vugs filled with (pyr-lmn) 2ndary muscovite a ser (contact?)

DESCRIPTION OF MIN.: Tunnel ½ full of sand most of dump washed away

Diabase Dike

SAMPLE NO.: HB-31

DATE: Aug 10th U.T.M. COORDS. E.: N.:

MAP NAME: Columbia-Humbug-LLANO

MAP LOC. NO.: 31 SAMPLER: R. Poley

SAMPLE TYPE: (ROCK, DUMP, IN-PLACE MIN.) Cut across 3' wide mineralized breccia zone

ROCK TYPE: Diabase dike cutting CBQM, med grained, hangwall: st. altd & brecciated. ftwall silicified & wk brecciation

TYPE UNIT: (SED., FLOW, TUFF, DIKE, SILL, LACH, PLUG, BATH.) Strongly brecciated & altd mineralized diabase dike.

PERV. ALT.: (NIL, WK., MOD., ST.) St. Chl of mineralized dike material Mod Ser. WK Argillic

MIN. OCCUR: (DISCREET VN., DIFFUSE VN., SKARN, REPLACEMENT, STOCKWORK-DISSEMINATED, OTHER) Dike strongly brecciated stained and altered. Strong limonite stain & fracture fillings Hang wall st. altered. St Sericite-Argillic WK Chl

THICKNESS: 2-3' ATTITUDE: N20E 43NW

ORE - GANGUE - WALL RK. RATIO: 3-7-90 limonite-MnOx-Si-Pyroxene-Plag?

OXIDE - SULFIDE RATIO: 100-0 in sample N26E Trend of Dike to SW of sample

ORE MINERALOGY + ABUND.: limonite gossan, limonite after pyrite cubes up to 1mm in fractures and possibly diseminated. Mn oxides

GANGUE MIN. + ABUND.: Slight silicification of footwall.

DESCRIPTION OF MIN.: Hangwall QM Mod Si St. Ser & Ar Mod chl