

Ore Deposit

A vein of quartz and brecciated country rock, with walls of granite and amphibolite, strikes N. 30° W. and dips steeply southwest. The vein matter contains small amounts of lead, zinc, and silver. It is entirely oxidized on the upper adit level and contains sulfides on the lower level. Detailed sample data are shown on figure 6.

Later Production

Shipments to the Keystone mill were begun in 1945 and continued to late May 1946. Production through April 1946 amounted to 949.5 tons averaging 4.35 percent lead, 5.39 percent zinc, and 0.23 percent copper, with 0.19 ounce gold and 2.75 ounces silver per ton.

JUNO MINELocation, Accessibility, and Ownership

The Juno mine is about 1 mile north of Chloride. It is less than a mile off the Kingman-Chloride-Boulder Dam road, and there is a good road from this highway to the property.

The Juno property consists of two claims - the Juno (patented) and the Boulder Dam (unpatented). These claims are owned by the Producers Mines, Inc., of which Mr. Thorne of Pasadena, Calif., is president and Mrs. Thorne is the secretary. James H. Beauchamp, the present operator, obtained a lease on the property in February 1943.

History

The date of the original location was not learned. Prior to 1938, E. T. Lloyd and B. Miller owned and operated the claims. Mr. and Mrs. Thorne acquired the claims in 1938 and organized the Producers Mines, Inc. They granted a lease to James H. Beauchamp in February 1943.

Production

The property is said to have produced considerable tonnage. No old stopes are accessible, and no accurate figures of tonnages and grade of the ore shipped were obtained, except that the last shipment, of about 1,000 to 1,200 tons, in 1940 averaged 7 percent lead, 7 percent zinc, and \$12 gold and silver per ton.

Ore Occurrence

The ore occurs in a fissure vein in granite and gneiss. The vein ranges in width from 3 to 12 feet, strikes northeasterly, and dips 40° southeast. It carries zinc, lead, gold, and silver. The ore is oxidized for about 70 feet from the surface, but below that depth the zinc and lead occur as sulfides. It contains considerable pyrite.

Sampling

Data follow on two samples taken in the face of the south drift 45 feet from shaft 2 on the 100-foot level:

No.	Description	Assays				
		Percent			Ounces per ton	
		Pb	Zn	Cu	Au	Ag
2279	0 to 2-1/2 feet from hanging wall	0.4	3.8	0.09	0.03	0.85
2280	2-1/2 to 7 feet from hanging wall	1.2	3.0	.14	.34	2.75

Mine Workings

The main workings of the mine are inaccessible because the old No. 1 600-foot inclined shaft is now caved at the collar. A fire destroyed the hoist house. It is reported that this old shaft had about 200 feet of drifting on the 100-foot level, about 300 feet on the 220 level, and the same amount on the 300-foot level. There is no drifting between the 300-foot level and the bottom of the 600-foot shaft.

The No. 2 shaft is about 200 feet north of the No. 1 shaft. It is a vertical, 1-1/2-compartment, timbered shaft in good condition. It is 115 feet deep, and from the bottom Producers Mines, Inc., drove a drift north on the vein for 125 feet to connect with an old prospect shaft or winze. This company stoped up on this block of ore until the stope broke into the old underhand stopes of earlier days, which are now caved. Mr. Beauchamp, the lessee, has started a drift to the south on the vein to connect with the 100-level workings of the caved No. 1 shaft.

Later Production

Ore shipments were made from June 1944 through July 1945. These amounted to 1,329 tons that averaged 4.85 percent lead, 4.94 percent zinc, and 0.21 percent copper. The precious-metal content per ton was 0.1935 ounce gold and 6.69 ounces silver. There was no production after July 1945.

LIBERTY (SILVER HILL) MINE

Location and Accessibility

This property is situated on Silver Hill, which is just west of Chloride and south of the highway. A good dirt road leads to the property from the highway. The claims are in sec. 4, T. 23 N., R. 18 W.

Ownership

The Liberty mine, on two claims, is owned by S. Seger, Box 243, Chloride, Ariz., and is operated by the Liberty Hill Gold Mines, Ltd. R.P.M. Davis of 2356 Hollyridge Drive, Hollywood, Calif., is the president of the company. Joe Cline of Chloride is the resident manager in charge of operations.

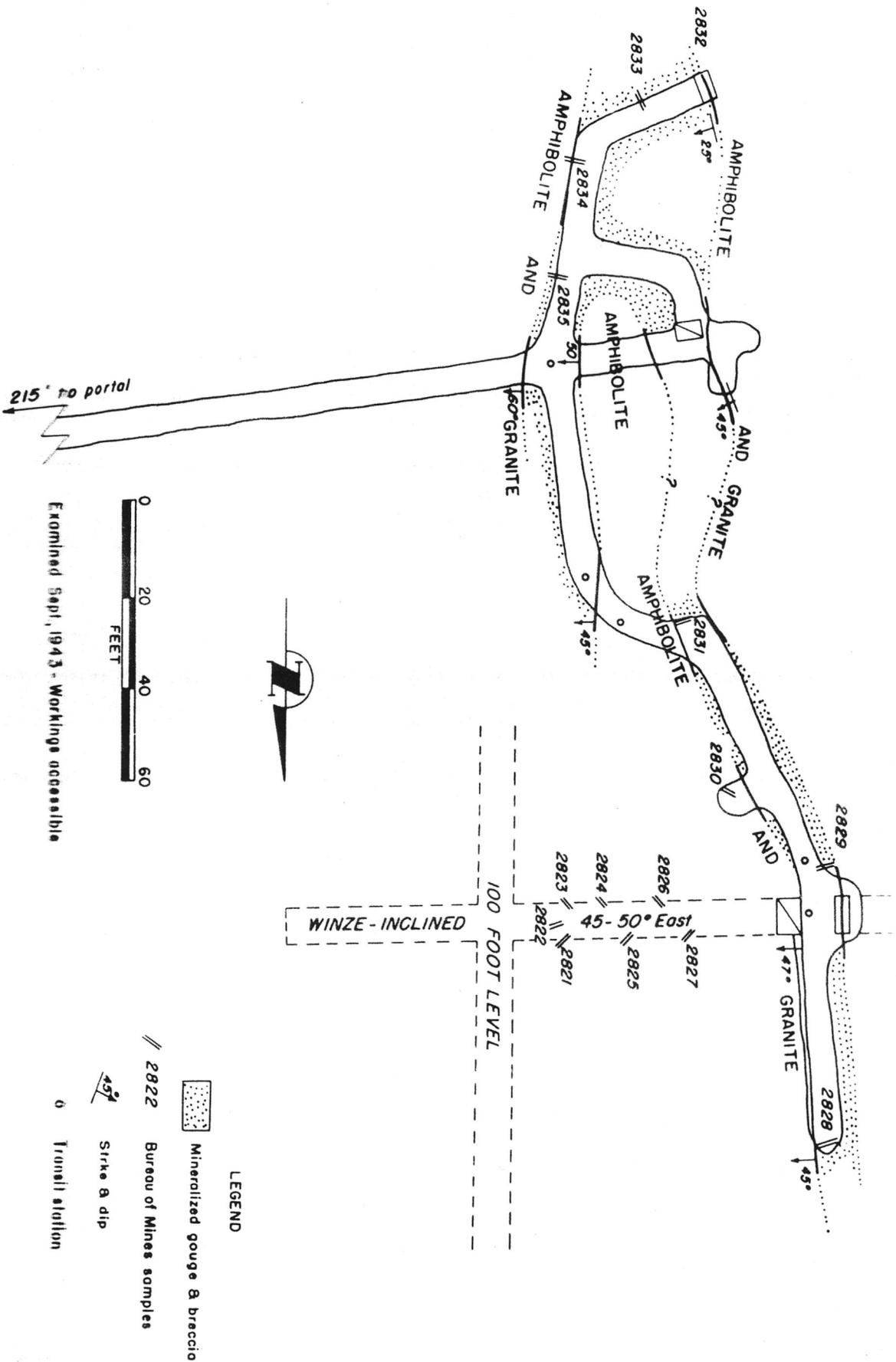


Figure 7. - Map showing sampling and geology of Liberty mine.

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History and Production

This mine was one of the first discovered in this district, and lead-carbonate ore with high silver values was mined from the shallow surface workings. The sulfide ore was reached at a depth of 75 to 100 feet and, as it contained zinc, the operators were unable to handle it at a profit. The property was idle for a good many years. Some work has been done by lessees, and some production was reported in 1916.¹⁰ The last of the lessees, S. M. Hedges and his wife, mined and shipped two small lots of ore in 1939. In December 1942, Hedges resumed operations and during the next 12 months shipped 211 tons that averaged 0.61 ounce per ton gold, 3.9 ounces per ton silver, 6.4 percent lead, and about 5 percent zinc. The average yield at the smelter after deducting rail freight was \$14.48 per ton.

The present operators have shipped five carloads of sorted ore and have several hundred tons of low-grade material on the dump. The average metal content of the first three cars shipped was 6.4 percent lead, 6.1 percent zinc, 0.37 ounce gold, and 3.8 ounces silver per ton.

Ore Occurrence

The ore occurs as shoots and lenses in a fault zone that is up to 30 feet in width. The country rocks are altered pre-Cambrian granite and amphibole schist. The dip of the vein or fault zone is 45° east, and the strike is north 10° west. Recent work, financed by a loan from the Reconstruction Finance Corporation, has exposed a lens of sulfide ore 70 feet below the outcrop for a length of 125 feet, a height of 65 feet, and a thickness of 6 feet (fig. 7). An old shaft about 250 feet north of this ore lens is reported to be 125 feet deep. This shaft is now inaccessible. It probably was sunk on a lens of ore. Shallow surface workings at a number of places along the outcrop of the fault zone indicate that bunches of ore were found there in the past. Nine of these old workings are distributed along 950 feet of the outcrop.

Development

A crosscut was driven 325 feet west from the east side of the hill to intersect the fault zone. Drifts were driven in the fault zone both north and south from the crosscut. Crosscuts also have been driven to the footwall of the fault zone, and a connection was made with an old stope from the surface. The crosscut intersects the fault zone at a depth of 60 to 70 feet vertically below the outcrop. At a distance of 125 feet north of the crosscut a winze is being sunk 150 feet below the drift on an inclination of 46° . The dip of the vein is less than the inclination of the winze so that, at a depth of 60 feet, several feet of the ore shoot is in the hanging wall above the winze. A station was cut at the 100-foot level, and drifts were driven north and south. In the south drift the ore ended 15 feet from the winze. In the north drift the ore had pinched to virtually nothing at a distance of

¹⁰ Federal Geological Survey, Mineral Resources of the United States, 1916.

60 feet from the winze (fig. 7). Operators' sampling on the main level shows lead and zinc values for about 50 feet south of the winze and a much shorter distance north of it. The ore exposures on the two levels suggest that the ore body strikes about 70° north. A little water was encountered at a depth of 80 feet, but at present the water level is being held at 140 feet. The flow of water is small. Half an hour of pumping each day suffices to keep the water down.

Sampling

Of the five cars of sorted ore that had been shipped by the present operator, returns were received on the first three, which assayed as follows:

Car	Percent		Ounces/ton	
	Pb	Zn	Au	Ag
First.....	8.6	5.5	0.40	4.7
Second.....	6.7	6.1	.36	4.1
Third.....	3.85	6.85	.36	2.7

The mine was shut down after January 1944. Shipments to Midvale, Utah, and to the Shattuck-Denn mill at Warren, Ariz., between September 7, 1943, and January 13, 1944, amounted to 447 tons averaging 6.80 percent lead, 5.88 percent zinc, and 0.48 percent copper, with 0.36 ounces gold and 5.2 ounces silver per ton.

Fifteen samples were taken in the mine (fig. 7); seven were taken in the winze and eight from various places in the old workings. Detailed data on these samples are shown in table 3.

TINTIC MINE

Location, Accessibility, and Ownership

The mine is situated about 2 miles by road west of Chloride on the paved highway that connects Chloride with U. S. Highway 93.

The property, two claims, is owned by Hawks and Shafer of Chloride and is leased to a partnership headed by Joseph G. O'Brien, and F. D. Shuck of Chloride.

History and Production

Few records of the early history of the mine are available. Intermittent production has been reported for the period 1925 to 1939.^{11/} Johnson and Fisher reportedly operated the property in 1934, 1935, and 1936. J. G. O'Brien recently reopened some of the mine workings with the aid of a loan from the Reconstruction Finance Corporation.

^{11/} Federal Geological Survey, Mineral Resources of the United States, 1925, 1928, and 1930.

Federal Bureau of Mines, Minerals Yearbook, 1937, 1938, and 1939.

TABLE 3. - Data on Bureau of Mines samples from Liberty mine

No.	Location	Description	Length, feet	Assays					
				Pb	Zn	Cu	Au	Ounces/ton	Ag
2821	Winze, 75 ft. from collar, N. side.	Soft, talcy, sulfides	6.0	2.3	3.6	0.03	0.185	1.20	
2822	Winze, 78 feet from collar, center of winze.	do.	4.5	2.6	3.8	.03	.125	2.95	
2823	Winze, 75 ft. from collar, S. side.	do.	5.5	.4	.1	.02	.045	.05	
2824	Winze, 65 ft. from collar, S. side.	do.	5.2	4.3	5.4	.09	.260	2.15	
2825	Winze, 55 ft. from collar, N. side.	do.	5.3	6.9	6.5	.02	.255	2.85	
2826	Winze, 45 ft. from collar, S. side.	do.	6.0	1.4	3.7	.03	.730	1.10	
2827	Winze, 35 ft. from collar, N. side.	do.	5.2	2.6	6.7	.20	.935	2.35	
2828	North end of main tunnel, breast.	Soft, oxidized.	4.0	.3	.1	.03	.005	.40	
2829	Main tunnel, 3 ft. S. of winze, W. side.	Soft, oxidized, some sulfide.	2.3	.2	.1	.02	.005	.50	
2830	Small winze, S. side, 10 ft. below drift.	Heavy sulfide	5.2	7.1	3.2	.47	.360	3.95	
2831	Main tunnel, 39 ft. S. of small winze.	Soft, partly oxidized	2.8	.2	2.6	.02	.090	.60	
2832	S. drift, SW crosscut, S. side.	Soft, talcy, oxidized some pyrite	4.2	.1	1.9	.04	.010	.40	
2833	S. drift, crosscut SW 15 ft. NE of end of crosscut.	Soft, talcy, oxidized	6.0	.2	.8	.02	.010	.25	
2834	S. drift, 45 ft. S. of main crosscut.	do.	4.2	.5	1.1	.04	.070	.30	
2835	S. drift, 20 ft. S. of main crosscut.	Soft, talcy, oxidized, some sulfide	4.0	3.1	.8	.04	.125	.45	

Description of the Deposit

The mine workings were flooded to within 30 feet of the collar of the main shaft when examined by the Bureau's engineers. The deposit contains lead, zinc, copper, and silver minerals, with a little gold, within a fissure vein that strikes northwest and dips 25° to 35° northeast.

Mine Workings

The principal workings are reported to consist of a 120-foot 2-compartment, vertical shaft, a 20-foot crosscut to the vein on the 120-foot level, and a total of about 250 feet of drifting both northwest and southeast on the vein at this level.

Sampling

Engineers^{12/} of the Reconstruction Finance Corporation examined the workings after the rehabilitation and sampled the vein east of the shaft. Over a width of 1.2 feet, the vein assayed 2.21 percent lead, 0.60 percent zinc, 0.70 percent copper, 0.01 ounce gold per ton, and 5.00 ounces silver per ton.

NEIL-LEWIS MINE

This property (one claim), situated about 1 mile by road west of Chloride, is owned by George R. Neil and Alfred S. Lewis of Chloride. The owners were unwatering and reopening the mine with the aid of an R.F.C. loan when it was visited by engineers of the Bureau of Mines.

The mine is opened by an inclined shaft about 100 feet deep with levels at 50 and 100 feet. The vein is oxidized on the 50-foot level. The 100-foot level was only partially cleared of water and cavings and was not accessible for examination. There is no reliable record of production or other data on ore in this mine.

COPPEROPOLIS MINE

The Copperopolis property (1 claim) is situated in Mineral Park about 6 miles by road south of Chloride. It is owned by a Mr. Kay and is leased to J. H. Hoffman of Kingman.

The shaft was filled with water when the property was visited by engineers of the Bureau of Mines. It is reported that a body of copper ore was exposed in the mine, but no evidence of such ore was found on the dump.

WHITE HORSE MINE

Location and Accessibility

This mine, on a group of three claims, is situated at the west entrance to Mineral Park, about 4 miles southeast of Chloride. The road to the mine is washed out in places, making it impassable.

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It is reported that a little lead ore was mined in 1925.^{13/}

History

It is reported that a considerable tonnage of gold-silver ore was mined near the surface. This is corroborated by the existence of several open stopes extending down at least 50 feet below the surface. The ground was later opened at depth with a vertical shaft and contiguous workings.

Ownership

The present ownership is in doubt. George E. Gandy, of Los Angeles, is the only person reported connected with the property.

Description of the Deposit

A steeply dipping fissure vein in granite is exposed intermittently on the surface. This vein has been mined to a depth of over 50 feet in places. A vertical shaft reported to be 250 feet deep has been sunk near the vein. One of the two reported levels (140 and 250 feet deep) is accessible; the other is flooded. On the upper level a network of fissure veins, mostly narrow, has been complicated by offsets on numerous small faults. Several very small lenses of lead and zinc sulfide minerals have been cut and offset by the faults.

The occurrence of lead and zinc minerals is neither wide enough nor continuous enough to make a body of mill-grade ore. The presence of copper in some of the vein material is evidenced by recent deposits of blue and green copper carbonates on the backs and walls of part of the upper level. Some chalcopyrite is present in the vein material.

Sampling

Two samples of typical vein material in the southern part of the upper level were taken about 150 feet in from the portal of this level. Assays of these samples show that the metal content is too low for mill-grade ore. Sampling data follow:

No.	Location	Description	Length feet	Assays				
				Percent			Ounces	
				Pb	Zn	Cu	Au	Ag
3310	150 ft. from portal of crosscut where it cuts the vein	Quartz with sulfide	2.5	0.3	1.5	0.88	0.005	1.85
3311	10 ft. east of point where crosscut cuts vein	do.	.6	.2	1.7	.76	.005	1.45

^{13/} Federal Geological Survey Mineral Resources of the United States, 1925.

DETROIT MINE

Location, Accessibility, and Ownership

The Detroit mine is situated about 6 miles south of Chloride. A good, graded road leads to the property, which lies 1/4 mile south of the road to the Summit mine. The spur road to the Detroit mine continues southward to the Golden Eagle mine, which adjoins the Detroit on the south.

The Detroit group of four claims is owned by Sam Norris of Kingman.

History

The early work on the Detroit mine dates back to about the 1860's. This was directed toward the exploration and extraction of gold ores, as shown by the mining of the oxidized portion of the vein and rejection of the sulfide ores which contain zinc. The claims had been abandoned and were relocated by Norris in 1938. No attempt was made to develop the mine until recently, when development loans were obtained from the Reconstruction Finance Corporation.

Production

No figures on early production were obtainable. The size of an old stope indicates that about 100 tons of ore was extracted from it. This was in the oxidized footwall portion of the vein. The sulfide ore on the hanging wall was not disturbed. It appears that some ore was mined from open cuts on the outcrop.

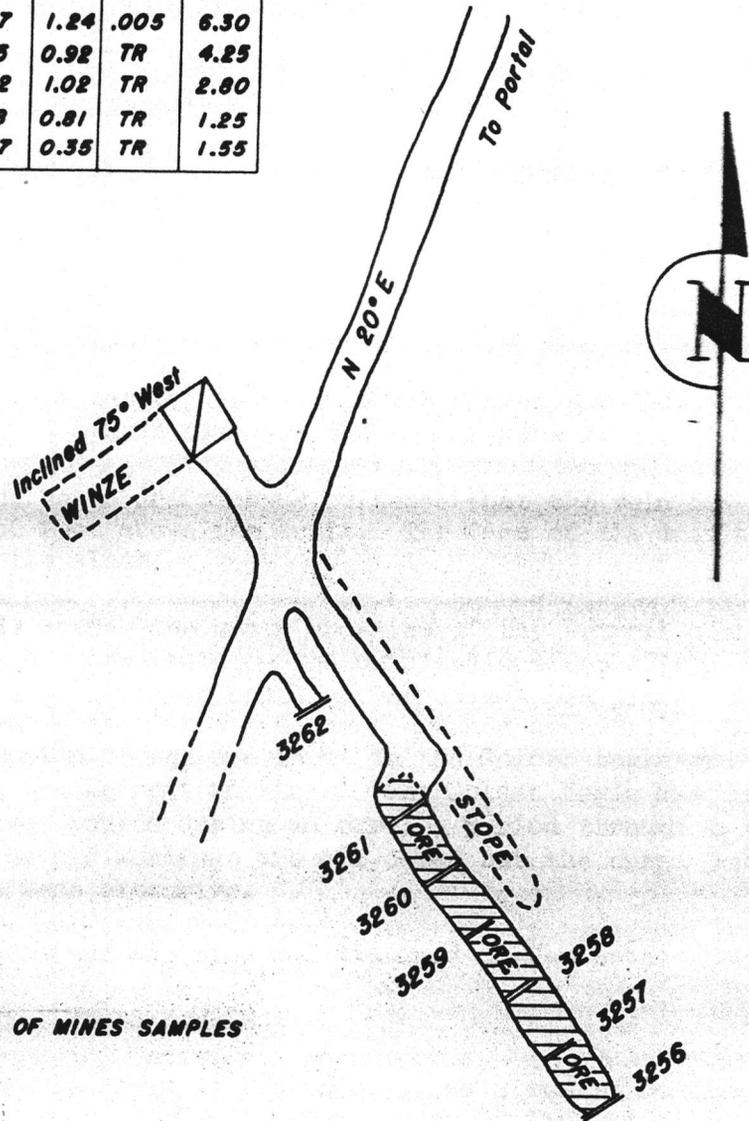
Ore Deposits

The ore occurs in a fault fissure in amphibolite and granite that outcrops for a length of 200 feet and is 3 to 14 feet wide. This strikes N. 35° W. and dips 76° southwest. The fissure filling consists of quartz, fragments of granite and schist, and gouge. Metallization occurred along the walls of this fissure, leaving barren material in the middle. Sulfide ore, carrying pyrite, galena, sphalerite, and chalcopryrite, occurs on the hanging-wall side. There is up to 4 feet in width of ore on the footwall side that is oxidized near the surface. The early mining was done in this oxidized ore-shoot.

Development

A crosscut adit, driven some 300 feet southeasterly, intersected the vein at 270 feet from the portal and 100 feet below the outcrop. A south drift on the vein from the crosscut is 90 feet long, and a north drift is 20 feet long. The south drift was started on the footwall but was turned to the hanging wall at 35 feet from the crosscut. A winze was sunk 100 feet on the footwall of the vein from the end of the north drift. The operator plans to crosscut to the hanging wall at the bottom of the winze and then sink 50 feet farther. Water was encountered 95 feet below the adit level. This enters so fast that little progress can be made in the winze until a pump that was ordered is installed.

BUREAU OF MINES SAMPLES						
NO.	WID.	% PB	% ZN	% CU	OZ. AU	OZ. AG
3256	5.0'	0.1	7.0	6.02	.010	13.90
3257	4.9'	0.2	4.4	3.70	.005	7.75
3258	4.5'	0.4	6.6	0.99	TR	6.10
3259	3.8'	0.1'	4.7	1.24	.005	6.30
3260	3.5'	0.1	4.5	0.92	TR	4.25
3261	4.0'	0.1	4.2	1.02	TR	2.80
3262	3.0'	0.1	1.8	0.81	TR	1.25
3263	DUMP	0.1	3.7	0.35	TR	1.55



/// 3256 etc. BUREAU OF MINES SAMPLES



Sept., 1943— Workings accessible

3263— Sample of dump material from winze

Figure 8. - Sample map of Detroit mine.

A small stope was mined from the oxidized footwall ore just south of crosscut on the adit level. Two shallow shafts, 40 and 50 feet deep, were sunk on the outcrop. The 50-foot shaft is over the south drift on the adit level. An old adit was driven about 1,000 feet northwest of the portal of the working tunnel, and some drifting was done on a vein. That work is inaccessible.

Sampling

A grab sample of the muck from the winze assayed 3.7 percent zinc, 0.1 percent lead, 0.35 percent copper, and 1.55 ounces per ton silver. The winze could not be sampled without interrupting the work in progress.

Seven samples were cut in the south drift. The samples show that there is a width of about 5 feet of mill-grade ore in the last 55 feet of the drift. The samples from this part of the drift averaged 0.3 percent lead, 5.3 percent zinc, 2.50 percent copper, and 7.2 ounces silver per ton. The sample locations and detailed sample data are shown on figure 8.

An old shaft above the south drift shows evidence that the vein is completely oxidized down to 50 feet above the drift. The face of the drift is very near the end line of the claim.

This ore shoot extends across the south end-line of the Detroit claims into the Golden Eagle ground. Open cuts on the oxidized outcrop of the vein show low metal values for some distance south of the common end line. If later development should prove that this ore shoot extends downward to the lower level, then the extension of the ore shoot in the Golden Eagle ground could be extracted through the Detroit workings. The Golden Eagle has lain idle for a long time. It was worked during an earlier period through a shaft 1/2 mile farther south. The old workings are all caved but the dumps bear evidence that the workings were extensive.

No production was made after the mine was examined in September 1943.

VICTORY MINE

The Victory mine, formerly known as the Wrigley, is situated on the east slope of the Cerbat Range, about 15 miles by road north of Kingman and 38 miles by road from Chloride.

F. Nelson attempted to rehabilitate caved and flooded workings with the aid of an R.F.C. loan. Entry to the mine was through a shaft reported to be several hundred feet deep and to have several levels driven on the vein. The work of reopening this shaft had been abandoned when it was visited by engineers of the Bureau of Mines. Subsequent flooding and some fresh caving has made the mine entirely inaccessible.

SUMMIT MINE

Location and Accessibility

The Summit mine is situated near the crest of the Cerbat range about 12 miles southeast of Chloride. It is reached from the west by a road that serves the Alpha, Detroit, and Golden Eagle properties also. A road from Kingman goes up the east side of the range to the mine. The higher sections of both these roads were in such a state of disrepair as to be almost impassable. An access-road proposal for the improvement of the road from the west to the Summit and Alpha mines was approved by the Bureau of Mines and was completed before July 1, 1945.

Ownership

The Summit group of 40 claims is owned by L. L. Robinson of Los Angeles, Calif. It was leased to the El Dorado Rover Mining Co., but the lease was relinquished in August 1943.

History

The U. S. Smelting, Refining & Mining Co., operating the mine on a lease, sank a vertical shaft in 1924. The Keystone Mining Co. shipped 12,000 tons of ore, which was stoped above the first level in 1936. The mine was thoroughly sampled in April 1942 by Miles P. Romney, engineer for the U. S. Smelting, Refining & Mining Co. The El Dorado Rover Mining Co. leased it in December 1942. This company did some new development on the lower levels with the aid of an R.F.C. loan and shipped 23 cars of ore, much of which was stoped above the first level. The company decided that not enough ore could be developed to supply a mill from this mine alone. It shut down in August 1943 and returned a second R.F.C. loan.

Ore Deposit

The ore-bearing vein, which is 3 to 8 feet thick, occupies a fissure in granitic and amphibolite that stand well with little timbering. It strikes northwesterly and dips steeply northeast. The principal gangue is quartz with a considerable amount of gouge. The ore minerals are galena, sphalerite, pyrite, and chalcopyrite, with some gold and silver. The sulfides are largely oxidized above the first level. The metal content is below ore grade in much of the vein. The material with sufficient concentration of the metallic minerals to constitute ore occurs in lenses that seldom occupy the full width of the vein. Some of these are too small to mine. Three ore shoots with sufficient volume to repay the cost of mining are exposed on the first level. One of these is developed on the second level also. Two of these shoots are lead-zinc ore and one is copper ore.

Development

The mine was opened by a 1-1/2-compartment vertical shaft with levels at depths of 160, 200, and 300 feet. The 160-foot level has about 750 feet of

drift and has a second connection to the surface through a 365-foot adit. Drifts on the 200- and 300-foot levels are 50 and 65 feet long, respectively.

Sampling

Detailed sample plats of the 160-foot, the 200-foot, and the 300-foot levels were furnished by the U. S. Smelting, Refining & Mining Co. (figs. 9 and 10). A few check samples were cut by the Bureau of Mines' engineers.

Later Operation

The mine was leased by Ralph R. Langley of Kingman after it was released by the El Dorado Rover Mining Co. Langley assumed the unpaid balance due on the first R.F.C. loan to the former lessee. When the mine was visited by a Bureau of Mines' engineer^{14/} in December 1944, Langley had sunk a 50-foot winze on the 160-foot level, about 400 feet northwest of the main shaft, and drifted in both directions from the bottom of the winze. The winze is at the middle of the No. 1 ore shoot shown on figure 9. The sublevel is about 180 feet long. Ore was stoped continuously from this sublevel to the arch below the 160-foot level. This ore shoot was found undisturbed above the 160-foot level and was stoped to 20 feet from the surface. Langley reported that 3,800 tons of ore was mined from above the level. A total of 6,049 tons of ore was mined in the period from October 1943 through April 1946. This averaged 4.42 percent lead, 7.18 percent zinc, and 0.76 percent copper. The precious-metal content per ton was 0.0738 ounce gold and 5.82 ounces silver. The ore was shipped to the Keystone mill after that started operating. The truck haul is 8 miles with the grade against the load in the last 2.5 miles.

When the mine was visited on May 27, 1946, Langley had started drifting on the 300-foot level to continue the level about 500 feet northwest under the No. 1 ore shoot. The level had been advanced 65 feet northwest and also a little to the southeast.

Langley reported that they were entering good lead-zinc ore to the northwest and some copper ore to the southeast. He was beginning to stope this ore while the drift was being advanced.

Concentration Tests

Concentration tests of a bulk sample taken from stope chutes were made in the Bureau of Mines testing laboratory at Salt Lake City. Selective flotation, after grinding to minus 65-mesh, recovered 86.8 percent of the lead in a concentrate that assayed 61.1 percent lead, 7.4 percent zinc, 2.1 percent copper, 1.87 ounces per ton gold, and 34.46 ounces per ton silver; 68.7 percent of the zinc in a concentrate that assayed 3.0 percent lead, 50.0 percent zinc, 1.5 percent copper, 0.30 ounce per ton gold, and 7.2 ounces per ton silver.

^{14/} Chas. A. Kumke.

A third copper-iron concentrate assayed 24.0 percent copper, 0.27 ounce per ton gold, and 2.15 ounces per ton silver. The copper recovery in this concentrate was 65.4 percent.

ALPHA MINE

Location, Accessibility, and Ownership

The Alpha mine is situated about 1 mile from the Summit mine on the western slope and near the crest of the Cerbat Mountains in sec. 32, T. 23 N., R. 17 W. It is about 7 miles southeast of Chloride and 4 miles east of the old Kingman-Chloride highway. It is 4.5 miles by road from the highway to the Alpha mine. The road to the two mines was improved under the access road program prior to July 1, 1945.

The Alpha group of four claims is owned by Caroline Daniels Moore of Kingman. The mine has been leased to Ralph R. Langley, Box 455, Kingman, Ariz.

History

The mine was located in the late 1860's or early 1870's. It is reported that \$200,000 worth of ore was taken from the mine and shipped. Part of this was from the oxidized zone and part from the sulfide zone. No records are available as to the grade or tonnage of the ore mined. The lower tunnel was partly cleaned out and retimbered with the aid of an R.F.C. loan. The greater part of the mine was accessible when the loan was exhausted and the work was suspended.

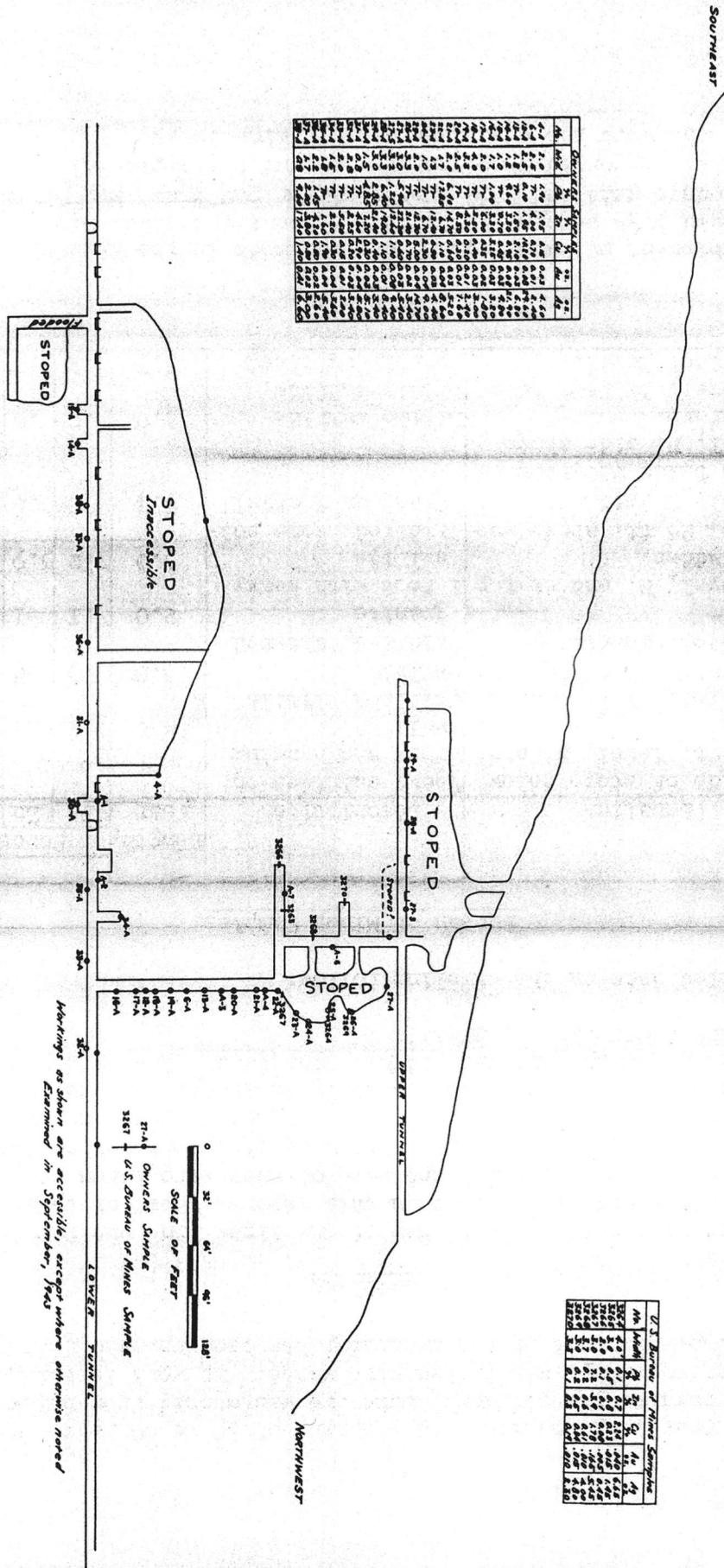
Description of the Deposit

The ore occurs as lenses in a fissure vein in granite. This vein strikes N. 60° W. and dips 50° to 65° northeast. It is continuous and has a considerable amount of gouge for the greater part of its length. There is very little metallization except in the sulfide lenses. The principal minerals are quartz, galena, sphalerite, chalcopryrite, and pyrite. From the work done so far, it appears that the lenses have no connection with each other and that they do not occur in any regular pattern.

Development and Mining

An adit was driven from the hillside a distance of 1,200 feet southeast on the Alpha vein (fig. 11). At a point 600 feet from the portal, a raise was driven 240 feet on the vein to connect with the upper adit or 200-foot level. This upper tunnel was driven from the surface a distance of 400 feet on the vein. From the lower level a stope over 300 feet long was carried to a height of 80 feet, according to mine maps. This stope has caved, and the back is inaccessible. A winze was sunk below the tunnel level, and it is reported that high-grade ore was taken from the winze and an adjoining stope. The winze is now flooded. A small stope has been mined from a sublevel off the raise to within a few feet of the upper tunnel. From the upper tunnel a

Figure 11. - Section in plane of vein - Alpha mine, Mohave County, Ariz.
Traced from map by Ralph Langley.



stope 150 feet long was mined to a height of 30 to 60 feet. This stope breaks through to the surface. Some ore was stoped from below the upper tunnel, and the stope was filled with waste. No work is being done at the present time, and most of the machinery has been removed from the property.

Sampling

A copy of Langley's assay map of the Alpha mine was furnished to the Bureau of Mines and is included in this report. Most of these samples were taken at irregular intervals, and some of them were taken so as to include small bunches of high-grade ore. Seven samples were cut by the Bureau engineer to check the other sampling. The samples from the north side of the small stope off the main raise are mill-ore grade. The Bureau samples were cut across the entire exposed width of the vein. The two sets of samples are shown on the assay plat (fig. 11).

Detailed data on the sampling follow:

Bureau of Mines Samples

No.	Location	Description	Length, feet	Assays				
				Percent			Ounces	
				Pb	Zn	Cu	Au	Ag
3264	N. side of stope below 200-ft. level, N. side	Heavy sulfides on foot and hanging wall	4.0	0.1	0.7	2.24	0.040	6.65
3265	Sublevel, 17 ft. south of raise.	Oxidized, little sulfide	3.0	.5	.8	.23	.015	1.45
3266	Sublevel breast.	Oxidized, altered granite	2.0	.1	.1	.08	.005	.45
3267	Sublevel, N. end at top of ladder.	1 foot with heavy sulfide	3.0	7.2	3.9	1.78	.165	5.45
3268	Raise, 25 ft. above sublevel, S. side	Oxidized, some sulfides on footwall	3.7	.2	.6	.61	.010	4.00
3269	Stope below 200-foot level, N. side above platform.	Little sulfide	3.0	.2	.5	.84	.015	4.80
3270	Sublevel, 38 feet below 200-foot level.	Little sulfide, partly oxidized	3.3	.1	.3	.19	.010	2.30

Later Operation

One shipment of 64.8 tons of ore was made to the Keystone mill in 1945. This averaged 3.94 percent lead, 5.05 percent zinc, and 0.50 percent copper, with 0.07 ounce gold and 7.30 ounces silver per ton. Mr. Zlatnik, of the Keystone mill, reported that the ore responded exceptionally well to selective flotation. No work has been done at this mine in 1946.

GOLCONDA MINE

The Golconda mine was one of the two deep mines of the district. The shaft was sunk to a depth of 1,600 feet, and extensive stoping was done above the 1,400-foot level. Production ceased when the mill burned in 1917. Total production to that time is reported at \$6,500,000 in lead, zinc, gold, and silver.^{15/} The mine has been idle since 1917, although good ore was reported on the 1,400-foot level. The workings are badly caved, and the mine stands full of water to the adit on the 600-foot level.

DE LA FOUNTAIN MINE

The De La Fountain claim is situated near the summit of the Cerbat Range, about 15 miles by road north of Kingman. It is owned by Messrs. Farley, Thomas, and Stevens of Flagstaff, Ariz., and is leased to L. M. Dickens of Kingman. The mine was operated recently and yielded two carloads of sorted ore in the last few months. The reported metal content of these shipments was 14 percent lead, 28 percent zinc, 0.02 ounce gold per ton, and 2.0 ounces silver per ton.

It is reported that four levels were opened in the course of the early mining. Only one is accessible. There are three stopes on this level, testifying to more substantial production during the earlier operation. The remaining ore on this level is in small pillars and along some of the stopes margins. The two carloads of sorted ore shipped by the present operator were gleaned from these stopes. Four samples, taken from such remnants of ore in the stopes averaged 3.6 percent lead and 14.2 percent zinc, with negligible gold and silver over widths of 1 to 4 feet.

JIM KANE MINE

Location, Accessibility, and Ownership

The Jim Kane mine is in Cerbat Canyon near the summit of the Cerbat range, 5.1 miles east of paved highway U. S. 93. The road to the property is in fair condition, but the grades are steep and the curves are sharp in the last 2 miles.

The group of 11 claims is owned by Jim Kane, of Kingman, who lives on the property.

History

A small shaft was sunk to a depth of 30 feet during the early mining in this district. Jim Kane relocated the claims in 1915 and has held them to the present time. The California Chemical Spray Co. leased the property in 1939 and drove some drifts from the lower tunnel. After 6 months work they gave up the lease. No work is being done at present. It is reported that a

^{15/} Arizona Bureau of Mines, Arizona Metal Production: Bull. 140.

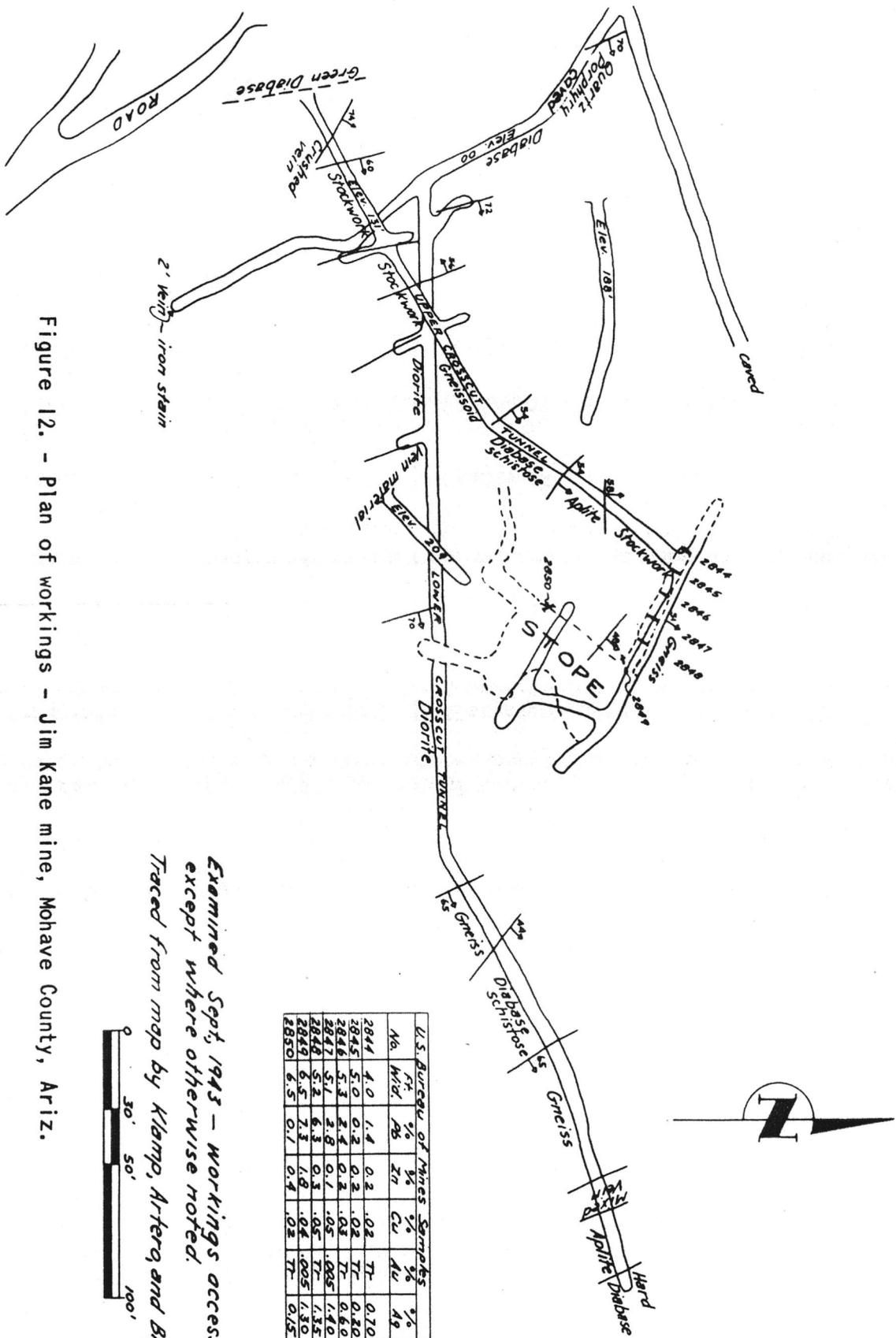


Figure 12. - Plan of workings - Jim Kane mine, Mohave County, Ariz.

Examined Sept, 1943 - Workings accessible except where otherwise noted. Traced from map by Klamp, Arterq and Blythe

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few cars of ore were milled at a local mill, and some ore was shipped direct to the smelter, but no figures were available as to the amount or grade of this production. Kane stated that a carload of ore had been shipped from the claim south of his house, which assayed 47 percent lead and 42 ounces per ton silver. This ore was packed out by burros. He also reported that during the first World War several hundred pounds of steel galena was sold for radio crystals at \$0.25 to \$1 per pound.

Description of the Deposit

The ore occurs in brecciated and altered gouge material in a fault zone striking N. 60° W. and dips 60° northeast. This zone varies in width from 1 foot to 20 feet. The country rocks are amphibolite and gneiss intruded by dikes and irregular masses of younger granite porphyry. In the one accessible stope the galena occurs in small bunches and in small streaks in altered granite. Several tons of high-grade galena ore have been sorted and stored in the stope. The ore is very spotty, and hand sorting would be necessary to obtain a milling grade of ore. There are several minor fault zones of similar character that have been partly exposed in the workings (fig. 12). Small showings of lead and zinc minerals occur in these, but in general the small bunches of ore are more scattered than in the major fault zone described above. A little beryl has been found in two small outcrops of pegmatite on the claim at the south end of the group. Mr. Kane stated that he had picked up 20 or 25 pounds of crystals. Two small pieces were found on the outcrops by the Bureau engineers. The pegmatite does not seem to be a continuous dike, but rather two separate bunches. Both of the detached outcrops are small.

Development

The underground workings are shown on figure 12, traced from an undated map by Klamp, Artero, and Blythe of the Producers Mining Co.

Sampling

The prospect was thoroughly sampled by the Producers Mining Co. A copy of their assays, supplied by Mr. Kane, is attached.

Table 4. - Producers Mining Co. samples from Jim Kane mine

No.	Description	Width, feet	Ounces		Percent	
			Au	Ag	Pb	Zn
2801	Dump at incline shaft.....	-	0.01	1.70	3.07	5.80
2802	Dump at 30 foot crosscut tunnel.....	-	.02	1.40	5.40	6.60
2803	Dump at 70 foot crosscut tunnel.....	-	.01	1.00	4.60	2.70
2804	Mill dump at middle tunnel.....	-	.01	0.60	3.20	1.10
2805	Grab of high-grade from dump.....	-	.04	7.50	59.30	3.60
2806	Face of north drift from stope.....	3.0	.02	2.70	1.56	1.20
2807	Cut north drift from stope, middle tunnel	4.0	.005	Trace	Trace	.60
2808	do.....	4.0	.01	.90	0.25	1.15
2809	do.....	5.0	.01	.90	3.54	.80
2810	do.....	5.0	.01	3.90	2.25	1.30
2811	do.....	8.0	.03	1.30	6.00	1.40
2812	Cut sample stope, north end hanging wall.	5.0	.04	29.40	3.65	1.30
2813	Cut sample stope.....	6.0	.01	.70	2.10	.80
2814	Cut sample stope, footwall.....	3.0	.01	1.30	5.80	3.80
2815	do.....	4.5	.005	.50	1.30	1.00
2816	do.....	3.0	.01	2.40	10.30	1.80
2817	do.....	4.0	.02	1.00	3.55	2.60
2818	do.....	4.5	.01	1.50	8.10	3.10
2819	do.....	5.5	.01	1.30	7.65	.70
2820	do.....		.005	.40	0.55	.50
2821	do.....	4.5	.02	.30	Trace	1.00
2822	Cut sample stope, hanging wall.....	4.0	.08	6.10	5.50	4.25
2823	Cut corner south drift from stope.....	3.5	.02	2.30	11.35	2.90
2824	Cut at corner E. side S. drift 4 ft. S. of manway.....	5.5	.03	3.80	7.80	1.90
2825	Cut in raise in hanging wall.....	2.0	.01	.20	3.00	.90
2826	Below 2825.....	2.0	.01	.50	2.50	1.20
2827	Below 2826.....	3.0	.04	4.30	13.60	3.80
2828	Cut 10 feet south of 2824.....	5.0	.02	1.10	1.80	2.50
2829	Cut 10 feet south of 2828.....	3.0	.02	2.30	0.25	.40
2830	Cut at face south drift.....	2.0	.02	2.00	5.75	1.00
2831	Grab from muck pile at face.....		.01	.90	Trace	.50
2832	Grab from pile in stope.....		.04	8.80	17.90	3.90
2833	No. 1 underhand middle tunnel 30 ft. from portal.....	3.5	.01	.80	5.50	1.80
2834	No. 1 underhand middle tunnel 30 ft. from portal.....	4.0	.01	.40	3.60	1.30
2835	No. 2 underhand, 60 feet from portal.....	1.3	.02	1.70	1.65	1.90
2836	do.....	3.0	.02	1.60	4.60	1.00
2837	Cut in bottom No. 1 drift south middle tunnel.....	5.0	.01	.20	1.40	2.50
2838	Cut at No. 1 chute, middle tunnel.....	9.5	.01	2.00	Trace	.70
2839	Cut face of 30 foot crosscut tunnel.....	2.3	.02	3.90	15.65	7.80
2840	Cut incline shaft on pillar.....	3.0	.01	1.00	4.80	11.20
2841	Cut from north incline shaft.....	2.5	.01	2.00	14.60	6.70
2842	Chip from outcrop south of middle tunnel.	2.5	.01	Trace	Trace	1.70

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Table 4. - Producers Mining Co. samples from Jim Kane mine (continued)

No.	Description	Width, feet	Ounces		Percent	
			Au	Ag	Pb	Zn
2843	Cut from incline raise.....	4.3	0.02	2.60	4.75	4.00
2844	do.....	3.0	.01	.80	4.30	5.40
2845	Cut from incline raise, north side.....	4.5	.01	1.10	11.70	5.30
2846	Cut from incline raise E. W.	2.0	.02	2.50	10.10	8.60
2847	Cut from tunnel 5.....	7.0	.01	.20	Trace	2.50
2848	do.....	5.0	.01	.30	do.	1.40
2849	Grab from dump tunnel 5.....		.01	.20	do.	1.10
2850	Cut incline raise above 2846.....	4.0	.01	.30	2.30	1.20
2851	Cut incline raise above 2850.....	2.0	.005	.10	.50	2.30
2852	Cut hanging wall 5 feet south 2851.....	2.0	.01	2.40	16.60	5.10
2853	Cut incline raise 10 feet 2843.....	3.2	.01	1.00	4.20	4.40
2854	Cut middle tunnel St. 15, north corner...	4.0	.01	.70	3.80	Trace
2855	Cut middle tunnel St. 15, south corner...	3.5	.01	.70	2.10	0.70
2856	Cut south drift 12 feet south of st. 15..	3.0	.01	.90	5.80	Trace
2857	Cut south drift 35 feet south of st. 15..	4.5	.02	3.30	Trace	do.
2858	Cut south drift 40 feet south of st. 15..	4.2	.02	4.50	2.00	0.60
2859	Cut middle tunnel st. 16, corner crosscut	2.5	.02	3.80	4.80	3.80
2860	Chip from boulders tunnel #5.....		.005	Trace	Trace	Trace
2861	Cut, face of open cut below tunnel #5....	2.3	.02	20.30	3.60	3.70
2862	Cut, outcrop below Kanes house.....	2.5	.005	.10	Trace	2.90
2863	Car sample from #1 chute.....	-	.01	1.60	10.70	.50
2864	Car sample from #2 chute.....	-	.01	3.10	17.10	4.20
2865	Cut, upper north tunnel.....	3.0	.01	1.80	7.20	2.40
2866	do.....	3.0	.01	1.60	9.60	5.50
2867	do.....	4.3	.01	3.60	6.80	4.20
2868	do.....	3.5	.01	1.50	4.00	7.20
2869	Cut, pit 300 feet north upper tunnel.....	3.0	.005	Trace	Trace	1.40
2870	Grab dump on Silver Queen claim.....	-	.01	3.90	0.10	1.00

These assays were copied from a sheet furnished by Jim Kane, who stated that they were copies of the samples taken and assayed by the Producers Mining Co.

Seven check samples were cut in the main stope. These agreed fairly closely with the Producers Mining Co. samples.

No.	Location	Description	Length feet	Assays				
				Percent			Ounces	
				Pb	Zn	Cu	Au	Ag
28-4	Stope drift, north breast	Altered granite and schist, some sulfide	4.0	1.4	0.2	0.02	Trace	0.70
28-5	Stope drift, 10 ft. from N. breast.....	do.	5.0	.2	.2	.02	do.	.20
28-6	Stope drift, 20 ft. from N. breast.....	do.	5.3	2.4	.2	.02	do.	.60
28-7	Stope drift, 30 ft. from N. breast.....	do.	5.1	2.8	.1	.05	0.005	1.40
28-8	Stope drift, 40 ft. from N. breast.....	do.	5.2	6.3	.3	.05	Trace	1.35
28-9	Stope drift, 50 ft. from N. breast.....	do.	6.5	7.3	1.8	.04	0.005	1.30
28-0	Stope, northwest side....	do.	6.5	.1	.4	.02	Trace	.15

CHICAGO GROUP

The Chicago group of four claims is situated on the north side of Cerbat Canyon, about 12 miles by road south of Chloride. The group is owned by J. A. Bell of Summerton, Ariz., and B. Ableman of Chloride.

There are a number of short tunnels, shallow shafts, and pits, all on oxidized outcrops of veins. One sample of oxidized vein material was cut at the bottom of a 30-foot shaft. The sample, taken over 2.5 feet, assayed 0.4 percent lead, 0.2 percent zinc, 0.06 percent copper, 1.9 ounces per ton silver, and a trace of gold.

CERBAT MINE

Location, Accessibility, and Ownership

This property is on a western spur of the Cerbat Range north of Kingman and south of Chloride. The mine is reached by turning to the east off paved U. S. Highway 93, 7.7 miles south of Chloride and following a dirt road 3.7 miles, and then turning left on a branch road that leads to the Cerbat mine about 1 mile north. The last mile of the road is impassable.

There are five claims in the group, owned jointly by F. A. Morrison, of Kingman, who is in charge of the property, and the Pelton brothers. Three of the claims are patented and two are unpatented.

History

The property was worked intermittently during the period 1869 to 1906 for gold and silver. It was credited with a production of \$200,000 in gold and \$50,000 in silver.^{16/} The mine was acquired by the present owners in

^{16/} Arizona Bureau of Mines, Arizona Metal Production: Bull. 140. ser. 19.

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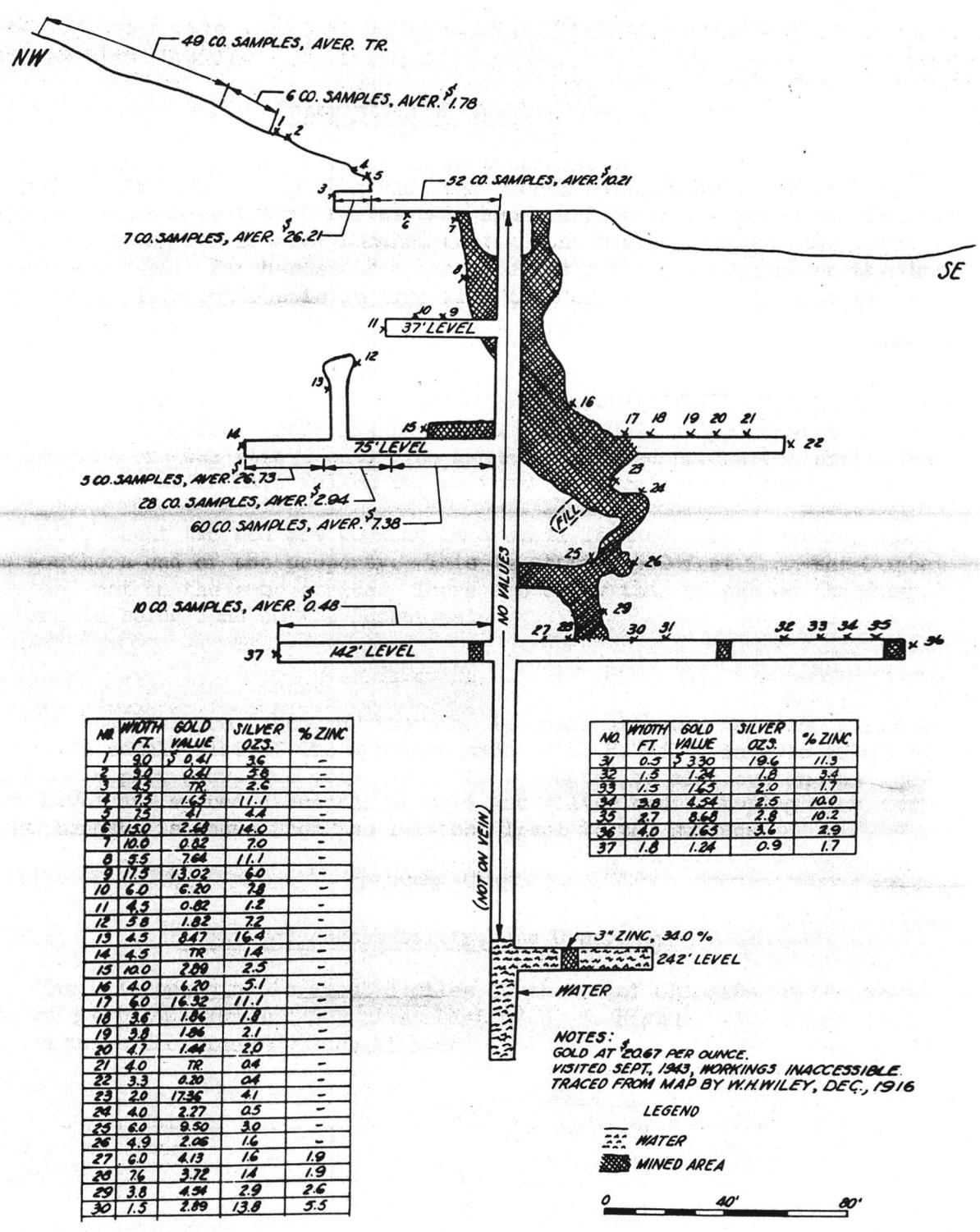


Figure 13. - Longitudinal elevation - Cerbat mine.

1914, but they have done very little work. Morrison stated that the ground was patented in 1877.

Description of the Deposit

The outcrop of the Cerbat vein is prominent and can be seen from a great distance. It is up to 15 feet wide and stands 15 feet above the surrounding surface. It can be traced for several hundred feet on the surface. The outcrop is missing for several hundred feet to the south, although the bedrock is well-exposed. Farther south a large quartz outcrop reappears on the Red Dog claim. This outcrop is in line with the Cerbat outcrop and may be on the same vein, although the vein does not appear to be continuous between the two outcrops.

The strike of the vein is N. 48° W., and the dip varies but is nearly vertical. A 750-foot shaft has been sunk on the vein. Some drifts were driven, and ore was stoped out. The ground has caved around the shaft, and some of the timbers have fallen in, so that the workings are inaccessible.

At present two men are working on a small lead carbonate outcrop near the southern end of the property. This is about 1,500 feet from the Cerbat mine and not on the same strike. There are a few tons of ore on the dump. No work is being done on the Cerbat vein.

Sampling

No samples were taken, as the mine is inaccessible. Morrison furnished a map and sample plat of the workings made by W. H. Wiley in 1916 (fig. 13). The sample plat shows two detached 10-foot lengths of zinc ore on the 142-foot level and sporadic bunches of gold and silver ore. Stoping over very short lengths is shown from the 142-foot level to the surface.

COLUMBUS MINE

Location, Accessibility, and Ownership

The Columbus mine is about 8 miles southeast of Chloride on the north side of Cerbat Canyon and 3.5 miles east of U. S. Highway 93. There is no dirt road to the mine from the highway.

This group of two unpatented claims is owned by Nina Uncapher of Chloride. J. H. Hall of Chloride has leased the property and is doing some development work.

History

The mine was located during the early activity in the district, probably in the 1870's, and has been worked for gold intermittently since that time. The property was leased to Hall and reopened with an R.F.C. loan. An additional loan was granted to develop the mine. This work was in progress when

R.I. 4101

the mine was examined in August 1943. Hall stated that several hundred tons of ore that assayed \$9 to \$16 per ton in gold had been mined from the workings near the surface about 8 years ago. This ore was treated in the mill of Producers' Mines, Inc.

Description of the Deposit

The ore occurs in small shoots or lenses in a vein of quartz and gouge that fills a fault fissure in pre-Cambrian amphibole schist and granite. The vein is 1 to 4 feet wide, as shown in an old stope near the surface. It strikes N. 15° W. to N. 30° W. and is nearly vertical. The surface features are shown on figure 14.

Development

A tunnel driven 500 feet into the hillside is in the vein for nearly all of the last 300 feet and attains a depth of 100 feet below the top of the hill. The vein is broken into several quartz stringers near the north end of the drift. Several short drifts have been driven from the tunnel on small cross slips and veins. A winze inclined 85° west is being sunk from the tunnel. It was some 50 feet deep when the mine was examined. The winze started on an ore shoot, but the ore thinned out in the top of the shaft and may be going into the hanging wall at a flatter dip. The winze is being continued at the same inclination in very low-grade vein material. There is a question whether the ore shoot continues downward in the hanging wall or has pinched out. It is planned to sink the winze to a depth of 100 feet and crosscut into the hanging wall in search of a downward extension of this ore shoot. The ore shoot has been mined out above the main tunnel for its gold content. There is very little sulfide ore above the tunnel, but oxidation does not extend below the tunnel level. A little water is pumped from the winze, but the volume was insufficient to hamper mining when the mine was examined.

Sampling

Eight samples were taken in the mine, five from the winze and three along the main tunnel (fig. 15).

Later Work

Mr. Zlatnik, of the Keystone mill, reported that development was carried ahead in 1945 and that 109.3 tons of ore was shipped to the mill in March and April 1946. This ore averaged 0.59 percent lead, 6.47 percent zinc, and 0.085 percent copper, with 0.046 ounce gold and 2.13 ounces silver per ton. He reported that the receipts increased to about 375 tons of better-grade ore in May.

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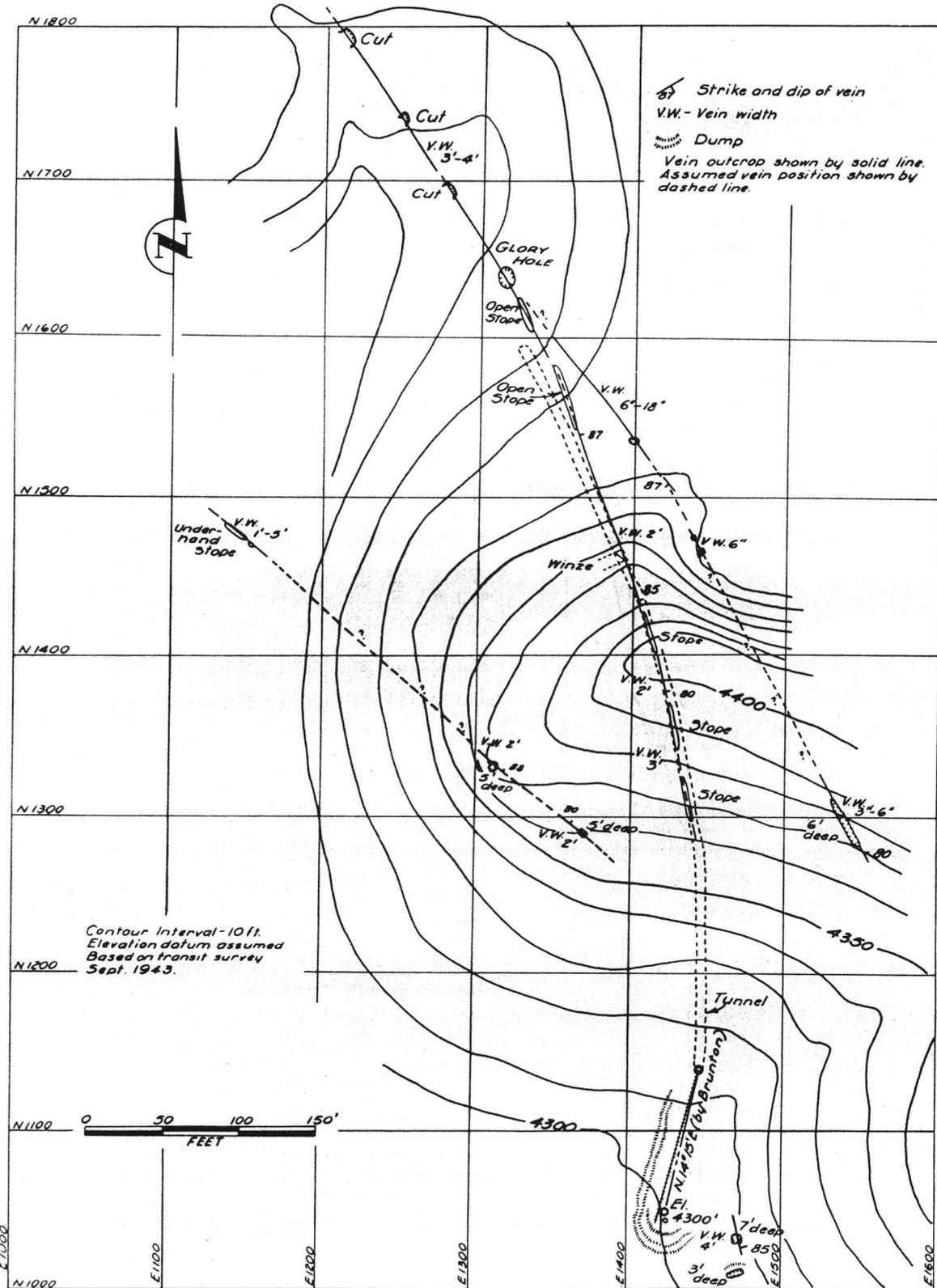


Figure 14. - Topographic map of Columbus lead zinc mine, Mohave County, Ariz.

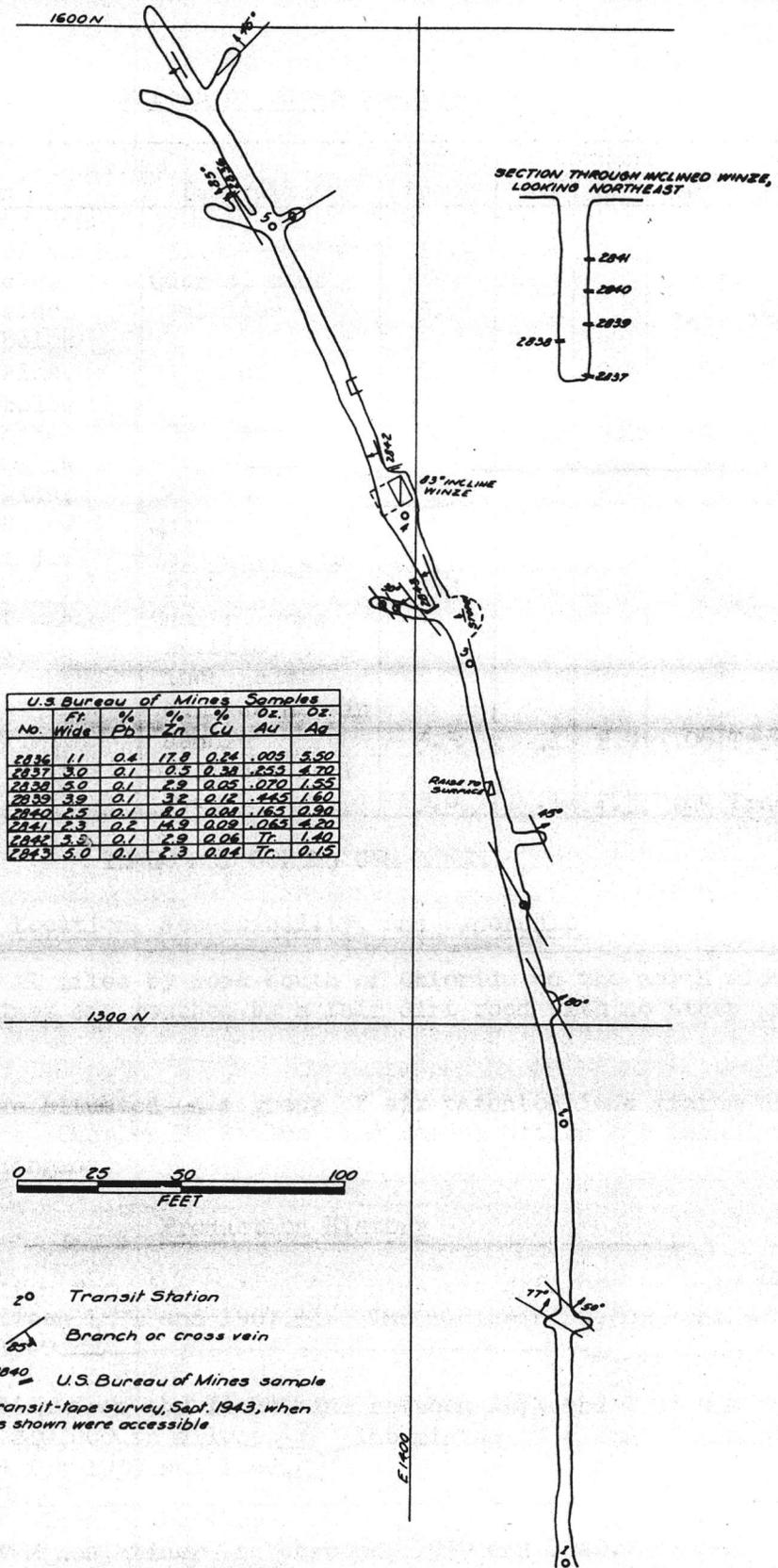


Figure 15. - Plan of underground workings, Columbus mine, Mohave County, Ariz.

Bureau of Mines samples

No.	Location	Description	Length, feet	Percent			Ounce	
				Pb	Zn	Cu	Au	Ag
2836	Main drift, west tunnel, 100 ft. north of winze.	Quartz, sul- fides	1.1	0.4	17.8	0.24	0.005	5.50
2837	Winze, 54 ft. below collar, south side.	Quartz, some sulfides	3.0	.1	.5	.38	.255	4.70
2838	Winze, 44 feet below collar, north side.	do.	5.0	.1	2.9	.05	.070	1.55
2839	Winze, 38 feet below collar, south side.	do.	3.9	.1	3.2	.12	.445	1.60
2840	Winze, 28 feet below collar, south side.	do.	2.5	.1	8.0	.08	.165	.90
2841	Winze, 18 feet below collar, south side.	Quartz, 1 foot of heavy sul- fide	2.3	.2	14.9	.09	.065	4.20
2842	Drift, collar of winze, north side.	Quartz, some sulfide, 3 inch heavy sulfide not in sample	3.3	.1	2.9	.06	Trace	1.40
2843	First northwest drift south of winze.	Oxidized, soft gouge	5.0	.1	2.3	.04	Trace	.15

IDAHO AND GOLDEN GEM MINES

Location, Accessibility, and Ownership

These mines are 11 miles by road south of Chloride on the north side of Cerbat, Wash. The mines are reached by a fair dirt road with no steep gradients.

The two mines are situated on a group of six patented lode mining claims owned by William Jones, Charles P. Stiles, and Samuel Stiles and leased to Ralph R. Langley of Kingman.

Production History

Reported production from the Golden Gem mine was \$180,000 in gold and \$10,000 in silver between 1871 and 1907.^{17/} The mining of 2,800 tons of gold ore was reported in 1940.^{18/}

Reported production from the Idaho mine between 1871 and 1905 was \$190,000 in gold and \$10,000 in silver.^{19/} The mining of a small tonnage of gold ore was reported for 1939 and 1940.^{20/}

^{17/} Arizona Bureau of Mines Bull. 140.

^{18/} Federal Bureau of Mines, Minerals Yearbook, 1939 and 1940.

^{19/} Arizona Bureau of Mines Bull. 140.

^{20/} Federal Bureau of Mines, Minerals Yearbook, 1939 and 1940.

Development

A plat furnished by the lessee (fig. 16) shows a shaft more than 600 feet deep on the Golden Gem vein, with six levels spaced at 100-foot intervals and drifts on the six levels aggregating slightly more than 2,000 linear feet. The elevation of the Idaho mine shows a 200-foot shaft with a drift 90 feet northwest on the 100-foot level, a 60-foot drift on the 80-foot level, and 50 feet of drifting on the 200-foot level. A small stope is shown between the 40- and 65-foot levels.

The underground workings could not be examined by the engineers of the Bureau. The Golden Gem shaft was filled with water. A part of the Idaho workings was open, but the mine could not be entered because of bad air.

Recent Operations

The Golden Gem mine had been unwatered and partly reopened recently with the aid of a loan from the Reconstruction Finance Corporation. The work of reopening the mine was stopped, and the mine had filled with water when it was visited by the engineers of the Bureau.

Equipment

There was a small flotation mill on the property. The mill equipment was in poor condition. Tailings near the mill showed that some ore had been milled.

ST. LOUIS MINE

Location and Accessibility

The St. Louis mine is situated in secs. 8 and 17, T. 22 N., R. 17 W., on the south side of Cerbat Canyon about 1/4 mile from the old town of Cerbat. This is about 14 miles north of Kingman, and about 15 miles by road southeast of Chloride. It is on a steep hillside about 700 feet above the bed of the gulch where the camp is located. There is a good road to the camp. The road from the camp to the mine is about 1 mile long and is very steep, crooked, and rough. Portions of this road are almost impassable because of loose rock.

Ownership

A. T. Lietzow, who is in charge of the mine and lives at the camp, stated that this group of three claims is owned by his sister, Elsie L. Lietzow. An R. F. C. loan was granted to clean out some of the old workings. Some new development work was financed with these funds.

History

The St. Louis mine was located in 1865 and has been worked intermittently since that time. Small shipments of ore were made in 1908, 1911, 1922, 1924,

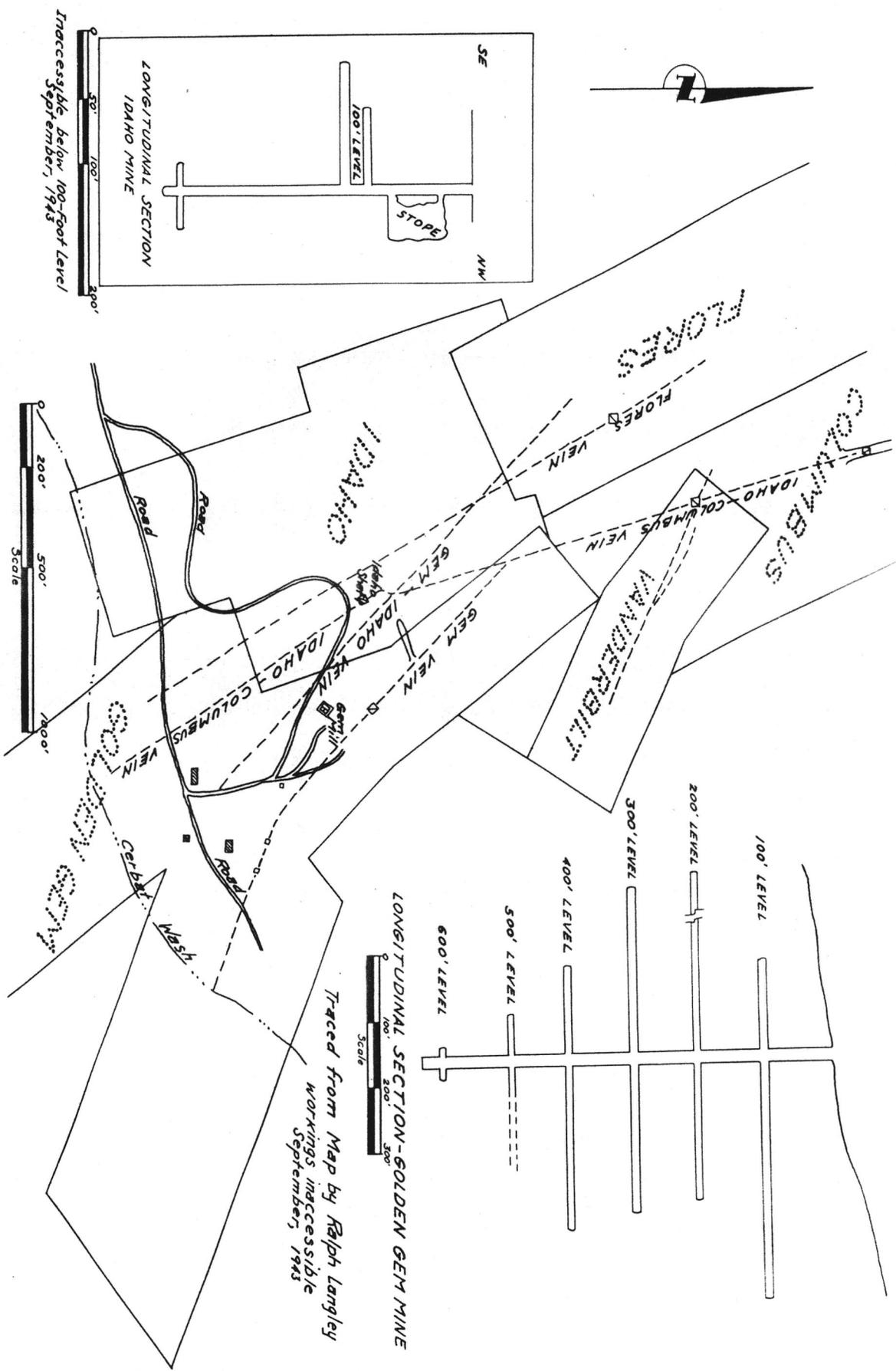


Figure 16. - Claim map and longitudinal sections, Idaho and Golden Gem mines, Mohave County, Ariz.

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1925, 1928, 1930, and in 1938.^{21/} The North Dakota Silver Co, bought the mine in 1922. A. T. Lietzow's brother was an official of the company and was in charge of the property for several years. He then acquired the property from the North Dakota Silver Co. for some debts owed him by the company. He died several years ago, and A. T. Lietzow has had charge of the property since that time. He stated that his brother shipped several cars of ore during the time he operated the mine, and that lessees also had shipped some ore. Smelter certificates show that 211.5 tons of ore were shipped from August 1935 to September 1940 that averaged 46.17 percent lead, 3.00 percent zinc, 0.2 percent copper, 8.54 ounces silver per ton, and a trace of gold.

Description of the Deposit

Several veins outcrop on the property. These outcrops are coated with a black manganese stain. The veins are thin, ranging from a few inches to 3 feet in thickness. The country rock is pre-Cambrian gneiss, and the veins have formed in nearly vertical fault fissures that strikes about N. 30° W. The principal vein minerals are quartz, galena, sphalerite, and chalcopyrite. A lens that has been mined by underhand stoping below the middle tunnel at the southeast end of the workings has a length of 42 feet. The stope opening indicates the vein to have been from a few inches to 3 feet thick. The ore was mined above the level and to a reported depth of 65 feet below the level. The total height stoped is possibly a little more than 100 feet. The operator reported that there is a 3-foot width of rich galena ore in the bottom of the stope under the waste fill. A raise was started toward this stope from the lower tunnel, which is about 115 feet lower than the reported depth of the underhand stope. A little stoping was done from the lower tunnel about 50 feet northwest of the main stope off the middle tunnel. Some early stoping was done from the upper tunnel about 200 feet northwest of the main stope. Most of that work is caved and inaccessible.

Development and Mining

There are about 2,000 feet of workings in the mine but the greater portion of this work is not on the veins. The main workings are the lower tunnel, the middle tunnel, and the upper tunnel, which reach depths below the outcrop of 288 feet, 107 feet, and 60 feet, respectively. The general direction of these adits is southeasterly. Ore shoots have been encountered in each of these tunnels, and in mining them small bunches of ore have been left in pillars and on the edges of the ore shoots. The middle tunnel is connected with the upper tunnel through an old stope, but there is no connection between the lower tunnel and the middle tunnel. The workings are shown in plan and section on figure 17, traced from a map by R. C. Jacobson, dated January 1922.

The ore mined was hand-sorted and shipped to the smelter. A few tons of ore was put through a small jig, but the jig concentrates have not been shipped. The ore from the middle tunnel is lowered by an aerial tramway to a bin near

^{21/} Federal Geological Survey, Mineral Resources of the United States, 1908-1930.

Federal Bureau of Mines, Minerals Yearbook, 1932-1940.

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the lower tunnel and loaded into trucks from this bin. A raise was started toward the main middle tunnel stop from the lower tunnel, which is about 115 feet lower than the reported bottom of the stope. This work was suspended because all the miners left and the operator has been unable to hire other miners.

Sampling

Five samples were cut from different places on the vein in the mine (fig. 17). Two samples were taken from the dumps outside and one sample was taken from the jig tailings.

Bureau of Mines samples

No.	Location	Description	Length, feet	Percent			Ounces	
				Pb	Zn	Cu	Au	Ag
2897	Middle tunnel, S. end of underhand stope, 30 feet down.	Galena	0.8	26.8	4.7	0.09	0.010	3.65
2898	Middle tunnel, N. end of underhand stope.	do.	.7	18.9	.1	.20	.005	3.50
2899	Middle tunnel, NN vein, near north stope.	Partly oxidized iron and manganese stain	4.2	.8	1.1	.07	Trace	.20
2900	do.	do.	2.5	2.1	1.3	.24	Trace	.85
3251	Dump from middle tunnel.	Some sulfides		.6	.5	.04	Trace	.45
3252	Dump at portal of lower tunnel.	do.		2.0	.8	.17	Trace	.80
3253	Lower tunnel, grab sample of 25 tons of jig tailings.	do.		9.7	.7	.24	Trace	2.75
3254	Middle tunnel, 30 feet west of old winze.	Oxidized, some galena	1.5	13.4	8.1	.32	0.005	4.35

O'BRIEN MINE

The O'Brien mine is situated in Cerbat Wash about 11 miles by road south of Chloride. The property includes six lode claims owned by Mr. O'Brien, who lives near the claims.

There is a steeply inclined shaft said to be 140 feet deep and to have a drift at the 100-foot level. When the mine was visited by engineers of the Bureau of Mines, a headframe had been erected and a hoist had been installed preparatory to unwatering and reopening the shaft. Water stood in the shaft at about 30 feet below the collar. The vein outcrops strongly for several hundred feet north of the shaft but appears to be highly siliceous and poorly metalized. There are no reliable reports on the metal content of this vein.

NEW LONDON MINE

This abandoned mine is situated about 11 miles by road south of Chloride. A steeply dipping vein was stoped near the surface. A large waste dump at an inclined shaft is evidence of extensive underground work. The principal workings are badly caved and are flooded.

LATER WORK AT OTHER MINES

Mr. Zlatnik reported on May 28, 1946, that work was in progress at the following mines:

Jupiter Mine

Doing development work. Shipped 15.5 tons to the Keystone mill that assayed 5.75 percent lead, 8.80 percent zinc, and 0.08 percent copper, with 0.01 ounce gold and 1.60 ounces silver per ton.

El Oro Mine (Formerly Copper Age)

This is near Chloride and is operated by R. Morgan, Bcx 470, Kingman. Development was done in 1945, and 253 tons of ore was shipped to the Keystone mill up to May 1, 1946. The ore averaged 2.15 percent lead, 4.73 percent zinc, and 0.10 percent copper, with 0.025 ounce gold and 2.37 ounces silver per ton.

Cromwell Mine

This mine is operated by Nick Lentine, who is mining gold-silver ore from a narrow pyritic vein and is crosscutting to a parallel vein. Three shipments ranging from \$12 to \$50 per ton in value were made to the Clarkdale smelter. A shipment was being made to the Keystone mill. On May 28, 77 wet tons had been received at the mill.

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Silver	0.10	0.15	Silver Crystal	0.10	0.15
...	0.55	0.65	Silver Hill	0.05	0.08
Minerals	0.03	0.05	Silver King	0.10	0.13
Silver	0.14	0.18	Silverore	0.17	0.20
Lines	0.06	0.10	Silver Scott	0.17	0.20
ho Cons	0.02	0.04	Silver Seal	0.80	1.00
ay	0.17	0.21	Silver Star	0.19	0.23
or	1.50	1.75	Silver Surp	1.50	1.60
City Gold	0.02	0.03	Silver Trend	0.10	0.15
Str. M	1.00	1.25	Square Deal	0.17	0.20
itted	0.18	0.20	Sterling Mining	1.35	1.50

SPOKANE

	Bid	Asked	Mineral Mtn.	0.30	0.40
ver	1.30	1.45	Nesco Mining	0.04	0.08
...	17.50	18.25	New Hilarity	0.11	0.15
Silver	3.00	3.25	Old Ntl. Ban.	15.25	16.00
es	14.50	15.00	Princeton	0.15	0.20
ie Res.	0.45	0.55	Quad Met	0.07	0.11
erve	2.40	2.75	RegO	7.50	8.25
ow	0.08	0.10	Royal Apex Sil	3.00	3.50
ources	14.75	15.50	Sidney	0.10	0.15
...	16.75	17.25	Silver Butte	0.16	0.20
Silver	0.18	0.23	Sil. Crescent	0.28	0.35
ike	25.25	26.00	Silver Ledge	0.10	0.15
ad	0.86	0.95	Silver Mtn.	0.75	0.90
ic Resrcs	0.85	1.00	Sunshine	8.75	9.25
uaw Gold	0.41	0.50	Thunder Mt.	1.40	1.60
L	0.11	0.17	Water Power	20.00	21.00
litan	2.75	3.25	Western Gold	0.10	0.15
old	0.90	1.00	Western Silver	0.21	0.26
Mines	1.00	1.25	Western Silver A	0.33	0.40

Golconda Mining Properties Increases Gamins' Reserves

SURREY, B.C. — Gamin Resources President Allen Stinson reported that the recent acquisition of the "Golconda" mining properties has significantly increased the potential zinc, gold, silver, lead reserves of the company.

Situated in Mohave County in northwestern Arizona and located within a four mile radius of the "De La Fontaine", "Sixty-Three" and "I.X.L." properties presently held by Gamin Resources Inc., the "Golconda" is comprised of five (5) patented and sixteen (16) lode mining claims.

Fourteen (14) mines, listed in order of historical significance, which exist on the property and have produced in the past are: Golconda, Tub-Bethel, Prosperity, Primrose, Little Jimmy, Blackfoot, Peach, Green Linnet, Mexican, Oro Fino, Virginia, Gold Reserve, Copper King, and Black Metal.

The "Golconda" mine was last worked on October 17, 1917, when a fire devastated the mill and head frame at the top of the 1,400 foot deep incline shaft. This milling plant had been rebuilt two or three weeks prior to the fire to operate at 250 tons per day, and fire insurance reduced to half in June 1917 with the installation of new fire hydrant equipment plus additional water pumping and storage areas. The accidental fire was caused by an overflow of heavy residual fuel used to fire the "oil field type boiler" during the "shakedown runs" of the new mill. Reconstruction of a new milling plant was planned to begin almost im-

mediately following the fire; World War I ended, zinc prices failed, and other than sporadic promotions to reopen the mine, no further mining was undertaken.

John D. Wanvig, Jr., mining engineer and superintendent of the "Golconda" mine from 1915 to 1917 reported in his letter of March 28, 1919 that: "during the last nine months of production, fully twenty-five (25) percent of the mill feed ores came from development work. Gold and silver values increased in the mine with depth."

Estimated tonnage of unmined ore in the "Golconda" mine workings at the time of the fire: 60,000 tons developed between the 1,400 and 1,100 foot levels, and 20,000 tons remaining in the upper levels. The ore was still continuing downward at the bottom of the shaft.

"Gamin Resources Inc." has retained Mr. Thomas R. Tough, P.Eng., independent consulting geological engineer for the company, to prepare a report with cost estimates, putting in place a program of exploration and development to confirm the tonnages and values as outlined above, with the view to bringing the property into production.

Dependent upon availability, coupled with timing in receiving the necessary funding, the company estimates it will take between 18 to 24 months to initiate a production program start-up.

The company's address is #16 - 10693 135A Street, Surrey, B.C. V3T 4E3; phone (604) 589-2555.

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