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PRELIMINARY SAMPLING RECONNAISSANCE
PRATT TUNNEL

WEST TROY Claim Group
Dripping Springs Mining District

Pinal County, Arizona

30 April 1959

for

UNIVERSAL COPPER CORPORATION

2308 East 17th Street

Tucson, Arizona

by

HEINRICHS GEOEXPLORATION COMPANY

P. O. Box 5671

Tucson, Arizona

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Composite, Sample-Assay and Index Map--In Pocket.

PRATT TUNNEL SAMPLING REPORT

INTRODUCTION

At the request of Mr. James E. Gaylor, President of Universal Copper Corporation, Heinrichs Geoexploration Company of Tucson, Arizona, was retained to conduct a preliminary assay sampling program in the Pratt Tunnel.

Location: The Pratt Tunnel is in eastern Pinal County, Arizona, in the Dripping Springs Mountains. It lies about 5 miles south east of Ray, 4 miles northeast of the town of Kelvin and about 2 miles southwest of the no-longer-existent camp of Troy, as shown on the U.S.G.S. 15 minute topographic quadrangle sheet of Ray, Arizona, 1910 edition. Access to the property is over a narrow track-trail-mountain road from the Dripping Springs Valley highway, about midway between Globe and Christmas, Arizona, at the Boice and M K Bar Ranch turn off. Follow the M K Bar Ranch signs to just beyond Troy, then keep to the right to the head of Hackberry Gulch and down the SW slope of the Dripping Springs Mountains.

SITUATION AND PROCEDURE FOLLOWED

On April 20, 1959, a field camp was set up near the portal of the Pratt Tunnel by John W. Marlatt, a geologist, Allen O. Clark, a miner, both of Heinrichs Geoexploration Company, and two assistants obtained locally in Mammoth.

Mr. Gaylor and Mr. Walter E. Heinrichs, Jr. spent the afternoon, this date, conducting the men through the tunnel on inspection to determine working conditions and assigning methods and areas to be sampled.

The re-opening of the tunnel had been recently completed from the portal to a point about 2100 feet in, where quartzite is in contact with dacite (?) porphory. At this point there is old timbering and caving from above that completely blocks the tunnel. From old reports and maps, it appears that the tunnel originally penetrated the Dacite (?) porphory and terminated in another hundred feet or so, presumably again in quartzite.

Passage through the tunnel was found to be barely adequate and arduous in places due to low timbering and gobbled fill. Only the natural air supply was available and it was tight and warm with only minor circulation. The final 230 feet of the tunnel was filled with thick colloidal mud, to a depth of up to three feet, due to blocked drainage by caved material at the inclined raise to the Alice No. 4 workings.

The following day, April 21, 1959, the above mentioned block was partially trenched to drain the rear end of the tunnel, and some timber was set to control further caving at that spot. Also, the length of the tunnel was rough chained to determine the accuracy of the maps, check rock types, and take some dips and strikes. It was decided that a 5 foot horizontal sample would be cut every 25 feet where working conditions were poor, and closer ones where conditions were

somewhat better. Two samples were cut by the end of this day. A visual inspection of these in the daylight the following day forced a slight revision of this plan as the samples showed more mineralization than had been apparent underground. The following three days were fully spent in cutting a total of 36 samples. These were then brought directly to Tucson and directly turned over to the Jacobs Assay Company.

CONCLUSIONS AND RECOMMENDATIONS

The attached composite map shows the approximate location of the claims and more important workings, including the known workings of the Pratt Tunnel, with an expanded scale inset of the northern portion of the tunnel showing the sample locations, data and assay results.

This information, and incidental observation in the area together with the old available reports, suggests that most of the past production came from the old Alice workings and was presumably mostly oxide. It would seem apparent that the Pratt Tunnel was driven to explore and hopefully, develop, the deeper Alice mineralization and the primary ore possibilities. Except for the tunnel-wall leached oxide scale or coating, all of the samples cut and mineralization observed in the tunnel was primary sulfide with minor secondary chalcocite. If appreciable enrichment exists it would appear most likely to occur above the tunnel elevation. The 45° incline from the tunnel to the Alice workings is about 5' x 9' in the clear

and may have been used, or was at least planned as a major transfer route.

The sampling was in, or along the margins, of quartzite--presumed to be the Troy formation. The copper content, though submarginal, rather pervasively mineralized much of the quartzite and appeared as thorough--fine disseminations of chalcopyrite and chalcocite coating with pyrite. The quartzite bedding dips 30° southerly and may be intruded by or overlain by a diabase sill. The diabase as is normally the case, is quite magnetic, but massive magnetite inferred in the old reports was not observed. This Troy-diabase series may be in turn overlain by Martin limestone and underlain by Mescal limestone. Ordinarily, the Martin would be expected to be a much better mineralization host rock than the quartzite. Probably much of the Alice workings are in overlying limestone formation. Both this and/or enrichment factors could account for better ore grades as inferred in the Alice workings. Similar speculation might be made regarding better mineralization in any underlying limestone formation. However, the economics here would depend on primary ore only, as enrichment would not be expected at this depth. Generally speaking, the structure and section are reasonably favorable and locally the mineralization intensity is good. However, the observed extent of hydrothermal alteration is locally not excessive.

For the time being, further sampling should be confined to the readily accessible Alice and other workings if such

exist, or to drilling and new surface exploration. In lieu of a basic more detailed economic geological evaluation of the area, followed possibly by geophysics and favorable drilling results, no heavy reopening or development type expenditure is recommended.

SAMPLING TECHNIQUE USED

Sampling was done by chipping channels with carbide-tipped moils struck by four pound single jacks. The chips were caught on canvas tarpaulins, transferred to sample sacks, labeled as to sample number, interval cut and position, carried out of the tunnel, sealed with wire/lead seals, and kept constantly locked in a vehicle and in our continual custody until turned over to the assayer. Due to the mud and muck underfoot, it was necessary in most cases to have the helpers hold the canvas up against the face while the channels were being cut. This slowed the operation considerably since it allowed only one sample to be cut at a time rather than two simultaneously as was planned.

Due to water being backed up for many years, much of the walls were saturated and coated with green secondary leached copper mineralization, presumably malachite. This made it necessary to first chip off the face of the area to be sampled and cut down the number of samples that might otherwise have been cut. It must be emphasized that although careful procedure was used to get as clean and fresh faces as possible, because of jointing and fracturing of the quartzite some contamination

of the samples was inevitable, due to deposition from the water along these fractures.

ASSAY RESULTS

Certificate No. 53934, of the Jacobs Assay Office, 30 South Main Street, P. O. Box 1889, Tucson, Arizona, dated 29 April 1959, is herewith attached, together with a sample-assay map and sample description table.

Walter E. Heinrichs, Jr.

P. O. Box 5671
Tucson, Arizona

30 April 1959

30 So. Main St.
P. O. Box 1888

JACOBS ASSAY OFFICE

PHONE Main 2-0813

REGISTERED ASSAYERS

Certificate No. **53934**

Tucson, Arizona, **April 29th**, 195**9**

Sample Submitted by Mr. **Henrichs Exploration Co**

Silica

SERIAL	SAMPLE MARKED	GOLD Ozs. per ton ore	GOLD Value per ton ore	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	SILICA Per cent Wet Assay
158346	#1	001	\$ 0.25	1 1/10	0.40	—	88 1/10
47	2				0.17		
48	3	Trace		0 2/10	0.11		96 0/10
49	4				0.13		
50	5				0.03		
51	6	0.005	0.17	0 2/10	0.32		81 2/10
52	7				0.08		
53	8				0.32		
54	9				0.32		
55	10				0.42		
56	11				0.22		
57	12				0.19		
58	13				0.10		
59	14				0.12		
60	15				0.21		
61	16				0.13		
62	17				0.82		
63	18				0.17		
64	19				0.34		
65	20				0.14		
66	21				0.01		
67	22				0.76		
68	23				0.39		
69	24				0.52		
70	25				0.17		
71	26				0.19		
72	27	0.005	0.17	0.6	0.52		93.8
73	28				0.24		
74	29				0.15		
75	30				0.02		
76	31				0.03		
77	32				0.04		
78	33	Trace		0.2	0.74		—
79	34				0.05		
80	35				0.15		
81	36	Trace		0.6	0.40		91.2

Figured \$35.00 per oz. Troy

Very respectfully

S. 8450

Paul P. Jacobs

SAMPLE DESCRIPTIONS

<u>SAMPLE NO.</u>	<u>INTERVAL</u>	<u>WHERE CUT, ETC.</u>
	(Measurements are south from the breast of the tunnel. The breast is a caved area where dacite porphory is in contact with quartzite)	
1.	31-36 feet	Channel cut, horizontally on east face in quartzite.
2.	61-66 "	As above.
3.	91-96 "	As above.
4.	121-126 "	As above.
5.	18 inches	Across contact at breast where caved.
6.	1-6 feet	As above for 1, 2, 3, & 4. A little of this could not be scaled first.
7.	6-11 "	As above for 1, 2, 3, & 4.
8.	11-16 "	" " " " " "
9.	16-21 "	" " " " " "
10.	21-26 "	" " " " " "
11.	26-31 "	" " " " " "
12.	36-41 "	" " " " " "
13.	41-46 "	" " " " " "
14.	46-51 "	" " " " " "
15.	51-56 "	" " " " " "
16.	56-61 "	" " " " " "
17.	66-71 "	" " " " " "
18.	71-76 "	" " " " " "
19.	76-81 "	" " " " " "

SAMPLE NO.	INTERVAL	WHERE CUT, ETC.
20.	81-86 feet	As above for 1, 2, 3, & 4.
21.	86-91 "	" " " " " "
22.	96-100 "	" " " " " "
23.	100-106 "	" " except on <u>west</u> face directly opposite <u>small</u> drift.
24.	151-156 "	Measured south from breast, in quartzite. Channel cut, horizontally on <u>east</u> face.
25.	176-181 "	As above. 181 feet is also the north side of the east leg of cross cut.
26.	Cut vertically. 4 feet	In west side of the cross cut on north face, 15 feet in from the west edge of the tunnel.
27.	5 feet	Cut in east drift of the cross cut, at 40-45 feet in from the east edge of the tunnel. Horizontal cut on <u>south</u> side.
28.	200-205 feet	Measured south from breast. Cut in quartzite in main tunnel, horizontally on <u>east</u> face.
29.	223-228 "	As above for #28 except on <u>west</u> face.
30.	Grab sample.	From material caved down from hanging wall of contact at incline shaft up to Alice #4 Level.
31.	293 Vertical 5 foot cut	Main tunnel, east face, just south of timber, in quartzite or contact with the quartzite.
32.	313-321 feet	South from breast. <u>8</u> foot horizontal cut on <u>east</u> face of tunnel across some pyrite seams in quartzite.

SAMPLE NO.	INTERVAL	WHERE CUT, ETC.
33.	8 foot cut	From 6 to 14 feet north from east drift at 1600 feet into tunnel from portal. Cut horizontally on east face.
34.	5 foot cut	50 to 55 feet in, in east drift at 1600 ft. on <u>north</u> face. Cut horizontally.
35.	Vertical cut of 4 feet.	37 feet in, in east drift at 1600 feet on <u>south</u> face.
36.	8 feet	Cut north-south in main tunnel at 1600 ft. cross cut in quartzite breccia. Channel cut overhead.

James E. Gaylor

6742-D E. CALLE LA PAZ
TUCSON, ARIZONA 85715

September 1979

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AREA CODE: 602

Cable: GEOEX



SEP 1979
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

GEOLOGY DEPARTMENT

Gentlemen: Re: Offer of Copper Mining Claims.

I am hereby offering my 49 copper mining claims (980 acres) which have a good showing of copper, silver, and gold. This property is located in the heart of the "Copper Porkchop" of Arizona, just five miles southeast of Kennecott's open pit copper mine at Ray. My claims come to within 1-1/2 miles of the Gila River; with the highway and railroad on my side of the river. I understand that Kennecott is building a \$9,500,000 copper refinery at Ray.

These claims include the old Alice Mine from which 50,000 tons of high grade carbonate ore was mined in 1902, running from 8 to 16% copper. Work was discontinued due to a 31% drop in copper prices, from 16¢ to 11¢ per pound, and other difficulties. They could not process sulfide ores at the turn of the century and ore under 7% was considered too low in grade for them to mine profitably. So the 200 feet of sulfide ore they found in the Pratt Tunnel, reported to average 2% copper, was too "low grade" for them to even consider. Today, it is considered high grade ore by anyone's standards. This ore, with its high silica content, could be very profitably mined today. I have the original map of the Pratt Tunnel made by Mr. Mead in 1904. The map shows that two beds of brecciated quartzite were crosscut near the end of the tunnel; the first, 30 feet wide, was drifted on for 120 feet, and the second, 260 feet wide, was drifted on for 80 feet. The old reports indicate that this quartzite ran 2% copper; and the fact that the drifts were driven on the quartzite, and at no other part of the tunnel, indicates that encouraging values were encountered. Of course, at that time ore of 2% copper content had no commercial value. It was just waste rock to the old-timers. All of the work done at the Alice Mine and Pratt Tunnel was done 77 years ago with the end in view of obtaining carbonate ores only.

The economics for mining here today are excellent; with high silica ore in the tunnel, close to the Gila River, highway, and railroad; and surrounded by 7 smelters and 2 refineries. Several firms attempted to reach the Alice ore bodies during both World Wars I and II, but they gave up when they ran out of money, the war ended and the price of copper took a sharp drop. The U.S. Government thought enough of this property to give an R.F.C. loan during World War II.

Altogether, now, the future of the property is very bright. It must be borne in mind that the condition of a number of copper properties, which today are large producers, was at one time not

at all as encouraging as is the present showing on these claims. My claims, along with surrounding claims, some of which are open for location, has every promise of becoming one of the greatest copper producers of Arizona. According to old newspaper clippings there was an operating gold mine at the turn of the century just east of my claims. There are no less than twelve porphyry dikes traversing the area, all of which have had an important bearing on the mineralization of the area, and with exploration at depth will be found to contain primary copper sulphides in sufficient quantity to be commercial ore under the present modern methods of mining and ore reduction. The dikes vary from fifty feet to over two hundred feet in width.

The mineralogical character of the ore on my claims is virtually the same as that of the ores produced in the various mines at Globe, Cananea, Clifton, Magma, Copper Queen, Ray, etc, where rich surface carbonate ores were found in limestone and other sedimentary rocks, the source of which was traceable to primary sulphide ores occurring at depth in porphyry and diabase dikes. In the Pratt Tunnel there is 50 feet (from 1600 to 1650) where the mineralization consists of fine particles of copper sulphide and native copper near the granite porphyry dike averaging 2.5% copper. This mineralization is undoubtedly the Alice vein exposed at a depth below the limestone, and the mineralization in the quartzite is traceable to the granite porphyry dike. The fact that the values are in the quartzite is conclusive evidence that further depth is required in order to reach the primary sulphide ore.

In 1900 the Troy Copper Company may have had just about the largest copper mining operation in Arizona going at that time on these claims. There was the town of Troy (now nothing but a chimney) just north of my claims where they had stores, a warehouse, bars, and a post office. The stagecoach went right through Troy from Globe to Tucson. The old COPPER HANDBOOKS show:

1902 (Vol. II)

Troy Copper Company, organized in 1900 with 100,000 shares @ \$10. Ames Bldg., Boston, Mass. "Mine is working 70 men, has three shafts, deepest one is 400 feet; 6,500 feet of tunnels and drifts. Oxide and sulphide ores are found in veins 3 feet to 11 feet wide, of unknown length and depth, and averaging 12% copper. About 3,000 tons of ore is stocked at the mine. Production for 1901 was 120,000 pounds secured from a 500-ton shipment of 12% copper made to the smelter for purposes of securing a thorough reduction test. Company estimates output for 1902 at 3,600,000 pounds." (The demand for copper in 1902 wasn't so great for only about a third of the population we have today in the United States. The price of copper then was only about 10¢ per pound.)

1903 (Vol. III)

At this time the area was very remote without railroad or highway nearby as we have today. The Handbook states: "The expensive wagon haul of 75 miles to Casa Grande has been a serious drawback in past operations." (Sometimes in those days the rivers would flood and they would be without coking coal, petroleum, and other supplies for weeks. There was a lot more water in Arizona 77 years ago than there is now, before the man with the pale face overgrazed the land.

1904 (Vol. IV)

"The main working tunnel of the Alice Mine (the Pratt Tunnel) is about 1,700 feet long (later lengthened to 2,230 feet) and will intersect the lode at a depth of nearly 800 feet. Ores from the Alice Mine run from 8 to 16% copper. The company has expended \$500,000 (a lot of money in 1904) in development and equipment and the property is regarded as valuable if given the railroad facilities absolutely necessary for its profitable operation." (Of course, now, there is a railroad and a good paved highway nearby.)

1905 (Vol. V)

"The Buckeye winze (now on my property) is said to show a 25-foot vein of malachite, giving smelter returns of 6 to 10% copper. The new smelter was blown in January 1905, but closed down after 10 days, owing to washouts which prevented receipt of coke and petroleum."

Very little mining was done in the area after that time, and all of the good sulphide ores which was just so much waste rock to them in those days are still there. Thirty-two tons of ore was shipped as a test in January 1914 from the Rattler Mine (just northeast of my claims) to American Refining smelter at Hayden assayed 5.22% copper.

During World War I Mr. John C. Devine, who had been employed by the Ray Mine (then called Ray Consolidated Copper Co.) for ten years, voluntarily resigned from his job as Assistant Superintendent and raised money to reopen the Alice Mine and Pratt Tunnel, because he had worked there before, and he was the best informed man about the underground conditions there. In an old newspaper clipping found at the University of Arizona he stated: "Eventually the main Troy workings will be on the west end of the group. The Buckeye shaft is down 500 feet and a cross-cut will be run from the bottom to tap the Climax Fault, 1,000 feet distant, which has an excellent copper showing on the surface. The Alice Shaft is down 400 feet and passes through 50 feet of 4% sulphide ore, too low in grade (in 1902) to be handled profitably at the time it was opened. This ore will be developed through what is known as the Pratt Tunnel."

Mr. Devine spent nearly a year trying to reach the ore in the back of the tunnel, toward the end of World War I, but he had uncaved only 1200 feet from the portal when the war ended and the price of copper dropped 33% and he gave it up. Mr. Devine apparently was considered a highly respected and conservative mining man at that time. He is now deceased.

In another announcement to the newspaper on November 30, 1918, Mr. Devine stated: "Three shifts of men are now at work opening up the old Pratt Tunnel at the Alice Mine in order to reach some large ore bodies of low grade (now high grade) concentrating ores that are known to exist in this portion of the property. It is expected that the first of these large ore bodies will be reached early in January at the rate the work is progressing. A commercial mine of considerable size will be opened up through the Pratt Tunnel." Devine had worked in the tunnel in 1902 when it was open and clean (before more than 50 years of contamination and leaching from the spring water coming down from the Alice workings) and he had taken samples. He obviously knew there were good copper values to go after. Unfortunately, he never reached the ore bodies. Today the tunnel is caved in 700 feet from the portal, and it is considered too dangerous to reopen.

Devine further stated: "The Pratt Tunnel which was driven a distance of about 2,230 feet some years ago, has opened up some ore in two different places. The elevation of this tunnel is about 250 feet deeper than the Alice Shaft, and just brings the development to the primary zone, where both primary and secondary sulphides are in evidence quite abundantly. This part of the property offers a better opportunity than any other for the opening up of a mine of large proportions, and there is no doubt in my mind that any development extended to the east from this tunnel following the present low grade ore, will from time to time encounter deposits of high grade ore, the existence of which was fairly well determined by the work done from the Alice Mine shaft.

"The work done on the east side of the Alice shaft on the lowest level cut a porphyry fault running somewhat across the general trend of formations, and it is this fault that produced some very high grade ore, and appeared to be making downward with increasing strength. It would require driving the Pratt Tunnel five or six hundred feet east in order to cut this ore, and considering the pitch of the orebody a stoping backing of about 400 feet would result from this development. The limit or volume of ore that could be mined here once the property is properly opened up should be very extensive, and judging from a comparison of the formations here with those of other large producers in the district, mining costs could be maintained as low or lower than those of any other property now producing on a large scale. Due to the possibility of considerable high grade ore running 10% or better being encountered on cross faults

throughout the area, it can be stated beyond the adventure of a doubt, that commercially the property will average better than 5% copper on a very large scale of operation.

Devine continued: "The property is so situated with relation to the railroad that transportation facilities should be ideal. It has been suggested in this connection that an aerial tramway might be considered to deliver supplies to the portal of the Pratt Tunnel and to transport ore from this end of the property to the railroad. The project is entirely feasible and the distance would be reduced to three miles--all down grade to the railroad and highway. The proximity of the Hayden Smelting plant just a few miles away is an economic factor of more than ordinary value. The short railroad haul together with the efficient method of transporting ores and concentrates that could be developed, would contribute largely to the profitable marketing of the low grade ores now available on the property, which have been heretofore not considered commercial, primarily due to inadequate transportation facilities." Of course, today, an ore belt and/or trucks on a paved road with a concentration mill on the Gila River would be the best way to go.

Mr. G. G. Wald, an engineer of the Ray Consolidated Copper Company, reported, sometime around 1916, as follows: "The property lies in the mineral belt of the Southwest, and surface indications and geological conditions are favorable for the mineralization of the Climax Vein, especially at its intersection with the various NE to SW cross faults. The fact that the faults intersect at acute angles is a favorable condition, as the zone of shattering is larger than if they cut at right angles. These shattering zones, and also the limestone beds are most likely to contain ore bodies." The Climax Fault, on my claims, is a very strong fissure. The prominent features are its strength and regularity traceable on its surface for a distance of 2,000 feet. Copper values are to be seen along its surface. I, personally, picked up a 3-pound lump of ore that assayed 36.5% copper. A large sample taken from the Pratt Tunnel dump assayed 5.1%.

Mr. Roy G. Mead, who was employed from 1912 to 1916 by the Department of the Interior as Mineral Examiner of the General Land Office, stated in a report written about that time: "The Alice Vein is a contact vein having a limestone hanging wall and a granite porphyry dike for a footwall. The general strike of the vein is about north 60 degrees east, and the dip about 45% to the northwest. The vein filling is iron oxide accompanied with copper carbonate ores. This vein has been explored to a depth of about 350 feet by means of the Alice incline shaft and the Pratt Tunnel, and a large tonnage of carbonate ores extracted which had a copper content in excess of 10%. The development work on this vein, while quite extensive, was done for the purpose of extracting the carbonate ores, and not with the view of developing the primary ore bodies; there-

fore, sufficient depth has not been attained to reach the primary ores. A map compiled by the writer several years ago when the ore body was exposed, is a geological section of the ore exposure of the shaft of the third and fourth levels of the Alice Mine. The ore exposed at that time was high grade and assayed from 6 to 12% copper." I have the map showing the four working levels in the Alice Mine.

When the old caved-in Pratt Tunnel was reopened by me in 1958 (after four years of work) to 1,600 feet from the portal the Phelps Dodge geologist cut a 9-foot sample that assayed 1.55% copper. At about the same time Magma Copper took a 14-foot sample that ran 1.20% copper, with a good showing of gold and silver and 82% silica. The 200 feet of sulphide ore was later exposed when the tunnel was opened further back, but they never came back for further sampling, because in 1958 this was considered too "low grade" to satisfy them. Today most Arizona copper companies are mining ore of less than 1% copper--much of it in the open pits closer to 1/2 of 1%. I took samples of good high grade ore in the Pratt Tunnel that assayed 3.04, 2.12, 2.01, 2.42, 1.47, 5.00, 5.14, 5.70, 4.73, 21.25, 7.54, 7.95, and 3.41% copper. See attached Assay Report.

Geologist F. L. Croteau of Canada inspected and reported on my claims February 1971 for Rimrock Mines of Canada, who had an option on the property at that time:

"The main copper bearing areas of Arizona have been subjected to considerable faulting and fissuring which originated from broad tectonic movements and from the more local intrusions of igneous rock. The faults and fissures thus created have proven to be excellent sources for ore deposition within the sedimentary rock sequence. The intrusive diabase and porphyry bodies were the likely carriers of primary sulphide material from the main igneous mass and should act as focal points for copper ore concentration. The Alice Mine area shows pronounced faulting to occur in a NE to SW trending direction and this together with the resultant fissuring has proved to be the locus for the ore bodies that occurred in the Alice Mine. A pronounced north-southerly fault occurs in the more westerly portion of the claim block and creates a sharp demarkation line between the limestone and quartzite bodies and gives definite indication that the quartzite body to the west formed the up-thrown side of the fault.

"Previous geological work reported from the Alice Mine-Pratt Tunnel indicate a descending series comprised as follows: Martin Limestone (Devonian), Troy Quartzite (Cambrian), Diabase Sill (Mesozoic), with the entire series intruded intermittently and irregularly by Quartz Monzonite Porphyry (possibly Tertiary) occurring both fairly massively and as definite dykes. The subject area has a record of production from oxide ore bodies and old reports indicate that primary sulphides were encountered

during extraction of the oxide ores. Structural conditions on the property are favorable for the accumulation of ore bodies. The igneous intrusives are essentially diabase and quartz monzonite porphyry which occur as dykes ranging from a few feet to around 200 feet and wider in thickness. Recorded information shows that minor copper oxide occurrences will commonly lead to major bodies both in the horizontal and vertical planes, and that oxidation is not merely a near-surface phenomenon. The substantiation of primary sulphide bodies on the claim group is a feature that requires deep-seated geological techniques."

Mr. Croteau went on to recommend geophysical work and drilling. The above report is similar to a report in PAY DIRT for June 1975 pertaining to the Pinto Valley's 350-million ton orebody: "The Pinto Valley orebody, like most of the large copper deposits, is of the porphyry or disseminated type. The principal ore mineral is chalcopyrite, occurring in very small grains and veinlets throughout the rock mass. A small amount of molybdenite is also present. Most of the mineralization occurs in an uplifted block of quartz monzonite porphyry."

Mr. George A. Checklin, B. Sc., P. Eng., carried out geological work on the Alice Mine claims between May and November 1972, and was the geologist recording the two drill holes for Rimrock Mining Co. He had no financial interest, either directly, or indirectly, in the lands or securities of Rimrock. He stated: "Silver, zinc and copper mineralization is present through much of the drill core, as well as molybdenite more locally. The quartz monzonite porphyry intrusives are potential mineralizers of adjoining silica-rich rocks, and may themselves be mineralized. Among the sediments the Troy Quartzite in particular is susceptible to mineralization. Other bodies of quartz monzonite porphyry, besides those encountered in the drill holes, outcrop on the property. Exploration of this property should continue. More geological mapping and another program of diamond drilling are recommended." (Drilling was terminated by the Metler Bros. Drilling Company before the drilling program was completed, because of some disagreement with Rimrock, and not by the Rimrock Mining Company. Rimrock, a small company with limited funds, bought an oil rig and hit several dry holes which broke them financially. They gave up this property very reluctantly.)

Checklin continues: "An induced polarization survey was carried out by Scintrex Mineral Surveys in June 1971. This survey encountered difficult ground contact problems (dryness, rock outcroppings, etc.) and severe telluric current noise, and coverage, therefore, was rather incomplete. However, one complete anomaly was outlined to the east of the Alice Shaft and part of another anomaly was outlined in the Buckeye Shaft area. Diamond Drill Hole 61 was evidently drilled into an unstable area. The hole passed through several slips and faults and these

included a wide fault zone near the bottom. There was over 500 feet of intruded quartz monzonite porphyry in this hole. Hole No. 81 went down into a relatively stable area but the target was not reached because the hole was not completed. Pyrite is found in all the rocks. Pyrite is particularly important in the Quartz monzonite porphyry and the Troy quartzite. The Troy quartzite seems to be fairly susceptible to the deposition of sulphides, since this type of mineralization occurred in much of the drill core from this formation in both holes. The supposed Mescal sediments also seem to be somewhat susceptible to mineralization. A band of such sediments sandwiched between two of four thin fine-grained porphyry intrusives in a strong fault zone carried marked chalcopryite, cuprite, and native copper. Some sections carried some disseminated molybdenite. Apparently more important, however, were sections of porphyry which carried a red or reddish-brown mineral which had an adamantine lustre and a bright orange-red streak. Although tentatively identified at first as suprite, this is more likely to be ruby silver. Other mineralization included native copper and a little yellow-brown sphalerite. The latter was generally surrounded by dark sulphide. In other rocks besides the quartz monzonite porphyry chalcopryite occurred in a number of places. The diabase and the volcanics contained some very fine-grained chalcopryite. Some malachite was present in the top part of the Troy quartzite and locally further down. A little gold is present locally. In summary, silver, zinc, and copper minerals are present through much of the Troy quartzite and the quartz monzonite porphyry in the two holes drilled, and molybdenite is present locally."

Scintrex Mineral Surveys found two impressive anomalies, while covering only a tiny portion of the claims. Their report is available for your inspection at my home. One of the two drill holes went through over 200 feet of silver. The holes did not hit the targeted copper ore body; however, the good mineralization in the holes indicated that we were close. Rimrock was anxious to continue drilling because they received so much encouragement from the two holes, but, unfortunately, they were unable financially to continue.

The Checklin report continues: "The widespread silver-zinc mineralization raises the possibility that large low-grade silver deposits, as well as copper deposits, may exist within the area of the claims. The main base-metal sulphide appearing in the two drill holes is dark-grey sphalerite, with which the silver minerals are probably closely associated. Galena (lead) was not seen in the core. In a number of cases (as in Bingham, Utah, and Butte, Montana) copper deposits lie closer to the parent intrusion, while silver, lead and zinc deposits are further out toward the perimeter. Silver, zinc, and lead occurring together suggest fringe areas of copper mineralization. The lead will be found further out than the zinc. Silver deposits were being mined early in the history of Globe, Arizona.

The Silver King Mine at Superior was an important producer of silver before it became a copper mine. The Ray copper deposits produce silver-bearing ores. Apart from the Alice vein porphyry dike there are numerous other porphyry bodies to be seen on the claims. There is a large body of quartz monzonite porphyry about 700 feet SW of the Alice Shaft. Malachite was found on the surface. A width of 350 feet is indicated. East of the Alice Shaft there is a proliferation of porphyry dikes, some of which apparently stem from the Alice Vein. At the east end of the claims a large body of quartz monzonite porphyry parallels a diabase body, and both of these intrusives lie within an area of Troy quartzite. Since the Troy quartzite can carry sulphide mineralization there is a possibility of a zone of enrichment at some depth below the surface. On this group of claims there are numerous drill targets. The two holes drilled in 1972 indicate that the area north of the Alice Mine is underlain by rocks carrying widespread sulphide mineralization. All other quartz monzonite porphyry bodies in the area were potential mineralizing agents and may carry metallic minerals themselves."

The way the faults and beds, especially the Alice vein, are making nearly straight down into the earth they could very well go down for a mile as the ore did at the Magma Mine at Superior, not far away. After 50 years of mining they are still taking out extremely high-grade copper ore from a depth of over 5,000 feet. All they had to start with at the turn of the century was a little vein of silver. They didn't look nearly as good then as the Alice Mine looks today. Yet they have sold nearly two billion dollars worth of copper--with no end in sight!

Dr. Bill Lacy, Professor of Geology at the University of Arizona, stated to me after examining the property: "There could be 2,000,000 tons of high-grade ore just in and around the Alice Mine." If this averaged 5% copper at today's prices it would approximate \$200,000,000 worth of copper, plus some gold, silver, and moly. This is good copper ore to process because in places the silica runs as high as 95%. Our National Defense Stockpile is depleted of copper while large amounts of copper is being used in solar energy collectors. The \$33,000,000,000 MX and other stepped-up defense programs will chew up a lot of copper. Any kind of military emergency could quickly push the price of copper up to two or three dollars per pound. In the future we will have to reckon with inflation caused by over-population and the "Unthinkable War."

All claims are contiguous. Maps, plats, and claim notices and Work Affidavits are filed in both the Bureau of Land Management in Phoenix and the Pinal County Courthouse in Florence. I am asking \$495,000 cash, or \$95,000 down with balance four years at 9%. No free options.

Very sincerely yours,


James E. Gaylor

30 So. Main St.
P. O. Box 1889

JACOBS ASSAY OFFICE

PHONE Main 2-0813

REGISTERED ASSAYERS

Certificate No. 53452 Tucson, Arizona April 4th, 1958

Sample Submitted by Mr. Universal Copper Corp

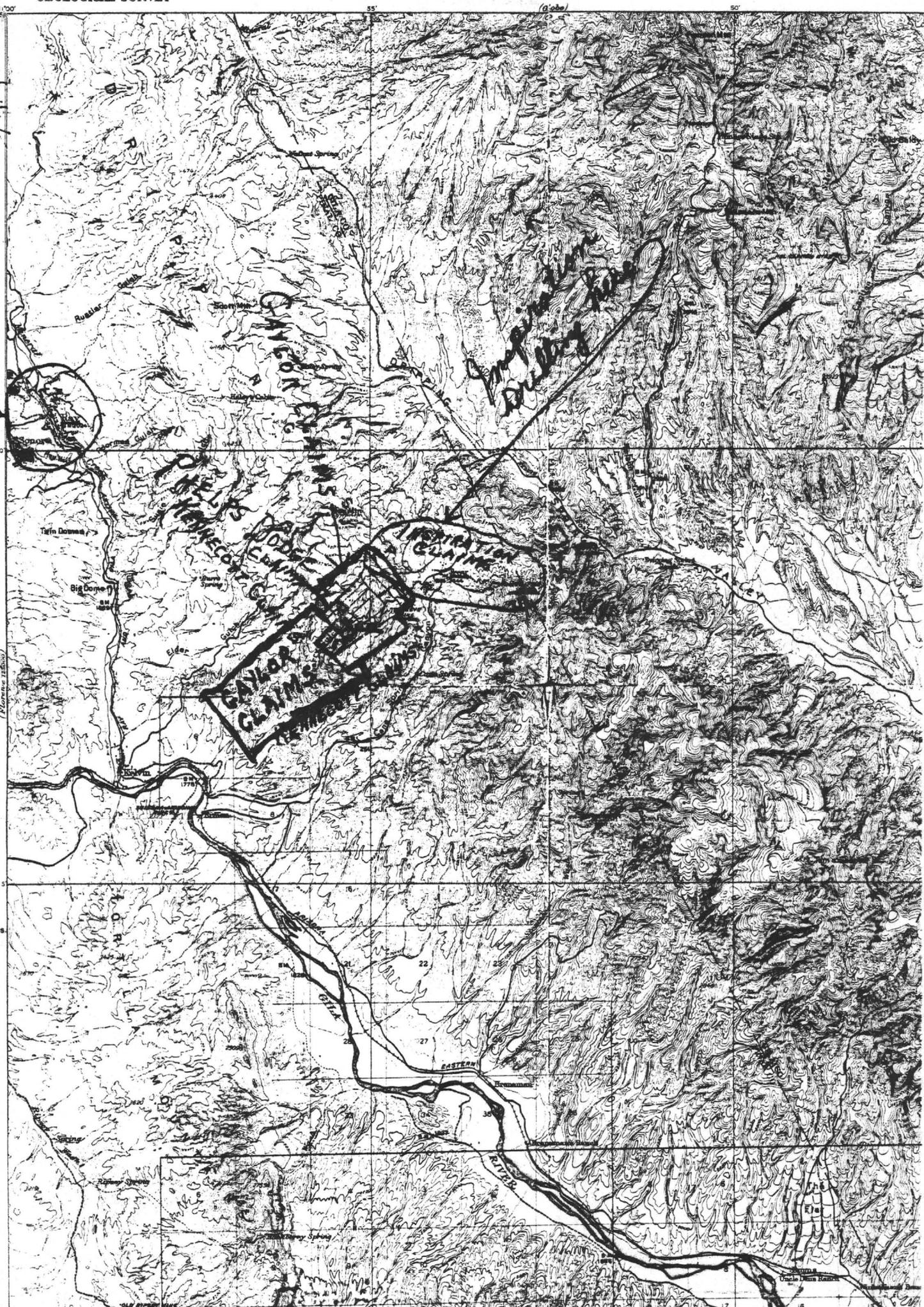
SERIAL	SAMPLE MARKED	GOLD Ozs. per ton ore	GOLD Value per ton oz *	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	PERCENT Per cent Wet Assay
156231	0		\$		304		
32	1				212		
33	2				201		
34	3				242		
35	4				042		
36	5				147		
37	6				500		
38	7				514		
39	8				570		
40	9				473		
41	T1				018		
42	2				020		
43	3				094		
44	4				21.25		
45	5				754		
46	6				795		
47	7				341		

* Gold Figured \$35.00 per oz. Troy

Very respectfully,

Ben P. Jacobs

Charges \$ 25.50
3.00
28.50



Impressible

Kennebec open pit

GRANITE CLAIMS

Impressible

WELLS

33° 15' 30" 30" 15" 00"
100° 15' 15" 15" 00" 15" 00"
T.45
T.55

101° 15' 15" 15" 00" 15" 00"
102° 15' 15" 15" 00" 15" 00"
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30 So. Main St.
P. O. Box 1888

JACOBS ASSAY OFFICE

PHONE Main 2-0813

REGISTERED ASSAYERS

Certificate No. 53934

Tucson, Arizona,

April 29th 1959

Sample Submitted by Mr. Henrichs Geo. Exploration Co

5.46%

SERIAL	SAMPLE MARKED	GOLD Ozs. per ton ore	GOLD Value per ton ore *	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	SiO ₂ Per cent Wet Assay
158346	#1	0.01	\$ 0.35	1 1/10	0.40	—	88 1/10
47	2				0.17		
48	3	Trace		0 2/10	0.11		96 2/10
49	4				0.13		
50	5				0.03		
51	6	0.005	0.17	0 7/10	0.32		81 2/10
52	7				0.08		
53	8				0.32		
54	9				0.32		
55	10				0.42		
56	11				0.22		
57	12				0.19		
58	13				0.10		
59	14				0.12		
60	15				0.21		
61	16				0.13		
62	17				0.82		
63	18				0.17		
64	19				0.34		
65	20				0.14		
66	21				0.01		
67	22				0.26		
68	23				0.39		
69	24				0.52		
70	25				0.17		
71	26				0.19		
72	27	0.005	0.17	0.6	0.57		93.8
73	28				0.24		
74	29				0.15		
75	30				0.02		
76	31				0.03		
77	32				0.04		
78	33	Trace		0.2	0.74		—
79	34				0.05		
80	35				0.15		
81	36	Trace		0.6	0.40		91.2

* Gold Figured \$35.00 per oz. Troy

Very respectfully,

Paul P. Jacobs

Charges \$ 8.45

JACOBS ASSAY OFFICE

REGISTERED ASSAYERS

Certificate No. **53934**

Tucson, Arizona

April 29th 1959

Sample Submitted by Mr. **Hennicks Exploration Co**

**SILICA
SiO₂
Per cent
Wet Assay**

SERIAL	SAMPLE MARKED	GOLD Ozs per ton ore	GOLD Value per ton ore	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	SILICA SiO ₂ Per cent Wet Assay
158346	#1	001	0.35	1 1/10	0.40	-	88 1/10
47	2				0.17		
48	3	Trace		0 2/10	0.11		96 0/10
49	4				0.13		
50	5				0.03		
51	6	0.005	0.17	0 7/10	0.32		81 2/10
52	7				0.08		
53	8				0.32		
54	9				0.32		
55	10				0.42		
56	11				0.22		
57	12				0.19		
58	13				0.10		
59	14				0.12		
60	15				0.21		
61	16				0.13		
62	17				0.82		
63	18				0.17		
64	19				0.34		
65	20				0.14		
66	21				0.01		
67	22				0.26		
68	23				0.34		
69	24				0.52		
70	25				0.17		
71	26				0.19		
72	27	0.005	0.17	0.6	0.52		93.8
73	28				0.24		
74	29				0.15		
75	30				0.02		
76	31				0.03		
77	32				0.04		
78	33	Trace		0.2	0.74		
79	34				0.05		
80	35				0.15		
81	36	Trace		0.2	0.40		91.2

* Gold Figured \$35.00 per oz. Troy

Charges \$ **84.50**

Very respectfully,

Paul P. Jacobs

PRATT TUNNEL

4-21-59
Rough chaining w/Nato

Portal to 390
390 to 485
485 to 559
559 to 620
620 to 762

Dacite. Possible break at 390?
Dacite. Contact at 485. Diabase?

762 to 822
822 to 861
861 to 1030
1030 to 1100
1100

Diorite?
Timbered. Dacite
Last point at which daylight can be seen is 762.
Beds N76E, dip 15SW. Tunnel N45E. Limestone.
Timbered with "S" bends. Altered diabase.
Altered diabase.
Fault material? or diabase.

1100 to 1135
1135 to 1153
1153 to 1202

Diabase.
Turn in Tunnel. This is a newer cut as older one is caved.

1202 to 1238

Dacite porphory

1238 to 1276

Timbered.

1276 to 1315

Turn into old tunnel at 1202. Head N 1°W.
Diabase.

1315 to 1355

Diabase. At 1238 break or contact. West or hanging wall is N5E, dip 75W. Slickensided Fault contact? Hanging wall S 50E, dip 25SW. Probably small slip.

1370

Diabase. S50E, dip 25SW.

1370 to 1415

Fault. Hanging wall; diabase N50E, dip 10SW

1415 to 1438

Footwall: broken quartzite? S50E, dip 75

1438 to 1456

Short drift to east. Turn around for cars?

1456-1482

Diabase. S60E, dip 38S.

1482 to 1600

Light timbering. Dacite porphory.

1605

Blocky and fractured. Not timbered. Diabase?

1600 to 1618

Low timbering. Dacite porphory?

1618 to 1656

Diabase. Small fault slip? at 1560.

1656 to 1700

Cross cut along fault.

1700 to 1730

Fault. Klondyke fault. Quartzite breccia. E-W, dip 60N

1730 to 1780

Timbered.

1780 to 1810

Sericitized, slickensided, altered sediments. Limestone? or schist? or both.

1810 to 1870

Timbered. Dacite porphory.

1870 to 1875

Quartzite: thin beds, light grey, bright yellow deposit as coatings, seams of soft pyrite. Might be usable as marker horizon. Beds N50E, dip 20S pyrite N10E, dip 45N

1875 to 2105

Quartzite. More seams of pyrite that vary in size, strike, dip thickness, etc.

1925

Timbered. Dacity porphory.

1995-2005

Incline to right, or east, to Alice #4 workings. bad caving here.

1925 2105

Quartzite

cross cut with raise in east drift.

~~xxxxxxx~~ Short drift and/or stope to east.

End of open part of tunnel. Caved material spilling out over top of old timber. Tracks go to here at least. Contact of Quartzite with dacite porphory at 2105. Quartzite dips 30°S. Strike E-W? or S 60 E.

(over)

FILED

COULD

314

Measured south from breast:

Short drift to east is 103 ft., drifted for 13 ft. and stoped in roof at end to height of 10-12 ft. Center of cross cut is 184 ft. south. Raise in east drift is at 18-25 feet into the drift. To the start of cut for incline to Alice #4 level is 230 ft.

1875 to 1880
1870 to 1875
1865 to 1870
1860 to 1865
1855 to 1860
1850 to 1855
1845 to 1850
1840 to 1845
1835 to 1840
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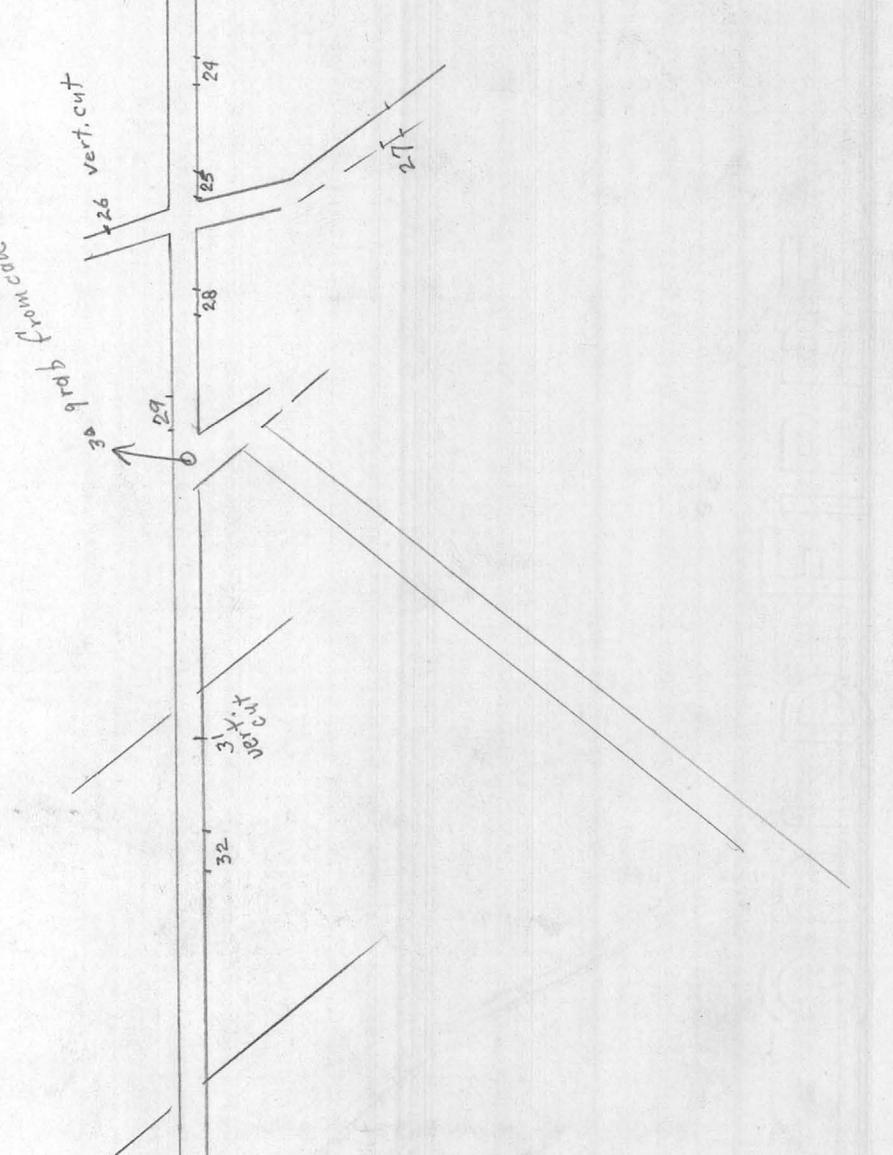


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ARIZONA - GILA AND PINAL COUNTIES
BANNER DISTRICT

1. CHRISTMAS MINE

- (A) LOCATED 10 MILES FROM WINKLEMAN AND ON WINKLEMAN-GLOBE HIGHWAY---TURN OFF FROM THE HIGHWAY ON SLIDE-ROAD TO THE PROPERTY, APPROXIMATELY ONE MILE WEST.
- (B) OWNED BY THE CHRISTMAS COPPER CORPORATION OF BEVERLY FARMS, MASS. 35 PATENTED AND 40 UNPATENTED CLAIMS. GENERAL MANAGER FRANK P. KNIGHT, JR. LEASED BY SAM KNIGHT MINING LEASE, INC., AND PRESENTLY BEING OPERATED UNDER THE DIRECTION OF SAM AND FRANK KNIGHT.
- (C) PRODUCING LESS THAN 100 TONS PER DAY OF 2% TO 3% COPPER WHICH IS SHIPPED TO HAYDEN SMELTER FOR LIME FLUX,--PROBABLY WOULD BE UNECONOMICAL TO MINE OTHERWISE, PARTICULARLY ON THIS SCALE.
- (D) ENTIRE CONTACT ON WEST (UP) SIDE OF CHRISTMAS FAULT HAS BEEN EXPLORED TO A DEGREE. LOWEST LEVEL IS 900' - VERY LITTLE WATER. EAST SIDE OF FAULT OR DOWN SIDE UNEXPLORED, WITH 1800' OR MORE OF VOLCANIC CAPPING OR PROBABLY PRODUCTIVE SEDIMENTS. FAULT IS SLIGHTLY MINERALIZED AND THERE WERE SEVERAL PERIODS OF MOVEMENT INCLUDING POST MINERAL, AND PRE-MINERAL.

2. DRIPPING SPRINGS VALLEY

- (A) MOORE PROPERTY--NEW MILL (POSSIBLY 50 TONS) FOR RECOVERY OF SILVER CHLORIDE.

REPLACEMENT DEPOSIT IN LIMESTONE-SILVER CHLORIDE AND LEAD OXIDE. MINE WAS NOT EXAMINED.

MINE IS NEAR HALEY PEAK AND MILL NEAR THE BAR-L-FLAG RANCH. NEITHER ARE OPERATING AT PRESENT.

- (B) WATERUP (?) HAS A GOLD PROSPECT ABOVE THE BAR-L-FLAG RANCH ON THE SOUTHSIDE OF THE VALLEY.
- (C) RANCHER AT BAR-FLAG BUILT A ROAD FOR WATER TO AN OLD MINE HE THOUGHT WAS CALLED THE WILLIE. THIS MINE WAS OVER THE HILL TO THE SOUTH FROM THE WATERUP PROPERTY. MAY BE THE SAME MINE OWNED BY HENRY NICHOLS OF ORACLE, ARIZONA AND HIS ASSOCIATES, WHICH IS REFERRED TO AS A POSSIBLE REPLACEMENT COPPER DEPOSIT. NICHOLS' AVERAGE ASSAYS FROM SURFACE RUN ABOUT 5%. THEY WANT ABOUT \$200,000 OPTION FOR THE PROPERTY TO ANY LARGE MINING COMPANY.

3. TROY AREA

SEVERAL OLD MINES HERE--THE BUCKEYE, ALICE MINE AND MANHATTAN MINE. ACCORDING TO TROY RANCHER, MARK ADAMS, NONE OF THE MINES PRODUCED VERY MUCH, BUT TROY HAS BEEN A SIZEABLE CAMP AT ONE TIME WITH CONSIDERABLE INVESTMENT IN MACHINERY, ETC. MR. SCOTT, AN OLD PROSPECTOR LIVING NEAR ADAMS, WAS NOT THERE AT THE TIME.

LEVINE, SCOTT, AND HARRY WRIGHT OWN SOME OF THE PROPERTY. ALSO, JAY BATEMAN OF MAMMOUTH HAD SOME INTEREST IN THE AREA.

HARRY WRIGHT, PARTNER IN PUEBLO COURT, TUCSON ARIZONA, HAS REPORT ON THE TROY (?) AND ALICE MINE AND MAP OF SOME WORKINGS MADE IN 1904. THEY REFER TO CONTACT, REPLACEMENT, AND VEIN TYPE COPPER DEPOSITS, IN ASSOCIATION WITH DIKE-LIKE INTRUSIVES OF PORPHYRY AND DIABASE AT OR NEAR CONTACT WITH SEDIMENTS. ALL KNOWN

BANNER MINING DISTRICT AREA CONTINUED:

3. TROY AREA CONTINUATION:

DEPOSITS SEEM RUDELY VERTICAL, TUBULAR OR ESSENTIALLY VEIN-LIKE. MAGNETIC ASSOCIATION IS MENTIONED FREQUENTLY. OPINIONS EXPRESSED BY SEVERAL ENGINEERS IN REPORT INDICATE THAT THEY FEEL A RELATIVE LARGE SCALE OPERATION AVERAGING 2% COPPER OR BETTER IS POSSIBLE.

4. CANE SPRINGS CANYON

THIS CANYON RUNS SOUTHWEST FROM TROY TO THE GILA RIVER AND IS FOLLOWED BY A ROUGH ROAD WHICH TURNS OFF FROM THE HAYDEN-KELVIN HIGHWAY ABOUT 2 TO 3 MILES EAST OF KELVIN. OLD SIGN AT THE TURN OFF SAYS "VANADUM MINE" AND POSSIBLY REFERS TO OLD WORKINGS AND HEADFRAME SEEN NEAR CANE SPRINGS JUST ABOVE THE ROAD ON THE EAST SIDE OF THE CANYON.

5. THE 79 MINE

- (A) LOCATED ABOUT 4 MILES NORTH OF HAYDEN-KELVIN HIGHWAY. ROAD TURNS OFF FROM HIGHWAY TO THE NORTH ABOUT ONE HALF TO ONE MILE WEST OF HAYDEN.
- (B) SHATTUCK-DENN PROPERTY--HAS NOT BEEN OPERATED FOR PAST TWO YEARS.
- (C) REPLACEMENT LEAD-ZINC IN LIMESTONE ASSOCIATED WITH MONZONITE DIKES-- NOTE THE TYPICAL CONTACT METAMORPHIC DEPOSIT. AREA IS INTERESTING CONSIDERING THE AMOUNT OF MINERALIZATION AND THE THICK SERIES OF SEDIMENTARY ROCKS WHICH HAVE BEEN SUBJECTED TO IGNEOUS ACTIVITY.
- (D) UNMINED ORE REMAINING IN THE MINE WHEN IT WAS CLOSED DOWN.

6. KULLMAN AND MCCOOL MINING PROPERTY

- (A) TURN OFF TO RIGHT APPROXIMATELY 2 MILES FROM HIGHWAY (HAYDEN TO KELVIN) ON THE ROAD TO 79 MINE.
- (B) ABOUT ONE MILE SOUTHEAST OF THE 79 MINE -- PROSPECT FOR COPPER, BUT PROBABLY TURN INTO Pb-Zn. ASSOCIATED WITH IGNEOUS DIKES CUTTING LIMESTONE. CONSIDERABLE GARNET IN THE LIMESTONE NEARBY.
- (C) PROPERTY UNDER LEAST TO FISHBACK (FISHBACK?) AND GOETZ WHO ARE SINKING UNDERGROUND SHAFT. PROPERTY CONSISTS OF SOME 20 UNPATENTED CLAIMS.
- (D) KULLMAN, PROSPECTOR FOR 14 YEARS IN THE AREA, HAS ADDITIONAL CLAIMS WHICH HE WOULD LIKE TO DEVELOP.

7. HAGWALL (?) (SWEDISH PROSPECTOR) HAS PROPERTY EAST, OR NORTH-EAST OF KULLMAN-MCCOOL PROPERTY IN NEXT CANYON TO EAST APPROXIMATELY ONE MILE AWAY. ACCORDING TO FISHBACK HE IS MINING GOLD. (?) ON A LIMESTONE-QUARTZITE CONTACT.

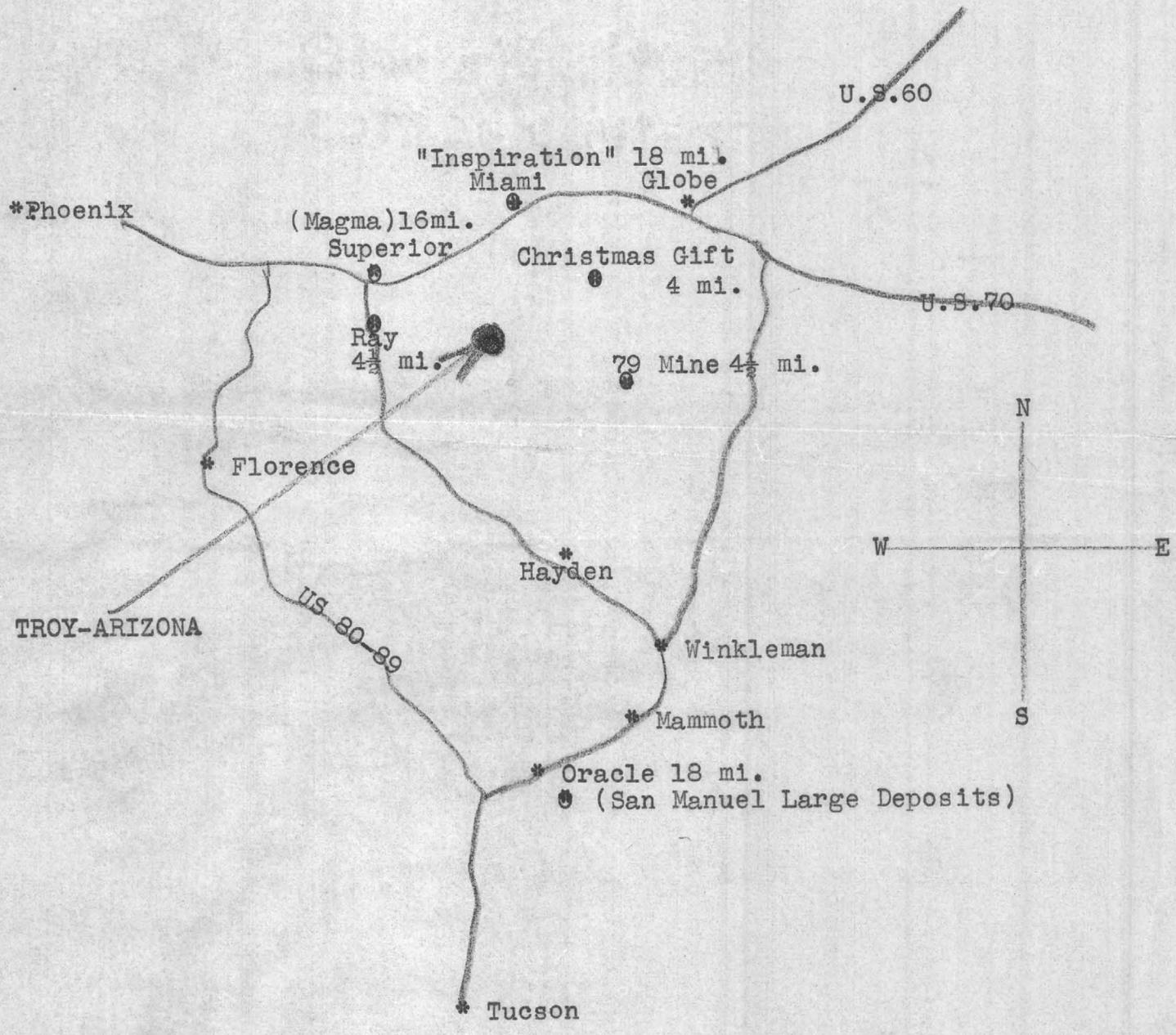
THESE LAST TWO AREAS ARE IN VICINITY OF OLD LONDON-ARIZONA MINE AS SHOWN ON RAY QUADRANGLE SHEET OF THE GENERAL AREA.

ADDITIONAL FACTS ON THE AREA MIGHT BE OBTAINED FROM MR. DAVIS AT WINKLEMAN OR HAYDEN, WHO IS SUPPOSED TO BE AN INFORMED OLD-TIME ON THIS DISTRICT.

IN GENERAL, THE BANNER DISTRICT WARRANTS FURTHER INVESTIGATION AT SOME TIME IN THE FUTURE.

W.E. HEINRICH, JR.

((● - Large producing mines Mileage shows distance from mines to Troy-Arizona))



TROY-ARIZONA COPPER COMPANY

ENGINEERS

The following well known engineers have been employed to examine the property:

LEO VON ROSENBERG

Mr. Von Rosenberg was on the property at various times from 1912 to 1916, studying its geology, securing and adding desirable claims and sinking test shafts.

ROY G. MEAD

Mr. Mead was employed from 1912 to 1916 by the Department of the Interior as Mineral Examiner of the General Land office. This work took him all over California and Arizona and enabled him to study the geology and various classes of mining and development work in these States. He has passed upon the holdings of many of the important companies operating in Arizona and has done much work in the mineral belt in which Troy is located.

G. G. WALD

At the time Mr. Wald made his examination of the property he was in the employ, as engineer, of the Ray Consolidated Copper Company located about five and one half miles from Troy, and consequently thoroughly understood this territory.

JOHN C. DEVINE

Mr. Devine was employed by the Ray Consolidated Copper company for a period of ten years. About 1916, at which time he was Assistant Superintendent at the Ray Mines, he voluntarily resigned and has given his personal attention to our property. He has done a large amount of shaft and tunnel work at the mine and consequently is the best informed man about the underground conditions there.

EXTRACTS FROM ENGINEERS' REPORTS

GEOLOGY:

LEO VON ROSENBERG:

"The geology of the area in which the property of the Troy Arizona Copper Company is situated, is more or less complex. Briefly stated, the rocks of the locality are granite, granodiorite, diabase, porphyry, limestone, quartzite, schist and conglomerates. The diabase, granite, granodiorite and the porphyry, occur as intrusions. The porphyry occurs mainly in the form of a very strong and persistent dikes, cutting through the granite, diabase, etc. Very probably the diabase was the first intrusion into the sedimentary rocks (sandstone, limestone, etc.,) when they were still in the horizontal position. The intrusion of the diabase was followed by the intrusion of the granite rocks, which caused the displacement of the diabase and further tilting of the sedimentary rocks. Then occurred the intrusion of the porphyry, followed by the ore deposition. It might be stated that the intrusions of the porphyry are closely related to the ore deposition although the diabase may also

have been a mineralizing agent. At various times the whole area was subject to much faulting and shattering.

The porphyry dikes are from a few to fifty feet in thickness, and in some cases are much thicker. They have a general north-easterly and southwesterly strike; in the eastern portion of the property, however, they assume a more easterly and westerly course. The dip of most of the dikes is rather steep. The ore occurs along the fault fissures in the granite and diabase (usually along or near the porphyry dikes) and also in the fractures of the sedimentary rocks, and along the bedding planes of the same. The mineralogical character of the ore is virtually the same as that of the ores produced in the various mines at Globe, Cananea, Clifton, Etc.

The ores consist of carbonates of copper and of the various copper and iron oxides and sulphides. The predominating gangue is quartz. Generally stated the ore bodies carrying oxides occur mainly on the contact of the different sedimentary rocks also on the contact of the sedimentary rocks and porphyry and diabase.

The sulphide ores will be found mainly in veins occurring in granite rocks, and in the porphyry and diabase. However, secondary copper ores may also be found in the veins associated with the intrusive rocks; especially in the upper portions of these veins."

GEOLOGY: East Group of Claims.

ROY G. MEAD:

"Briefly stated the geological formation underlying the group in question, consists of a basal granite exposed over the northern and eastern part, which is overlain on the south by sedimentary series consisting of quartzite and limestone which is traversed in an easterly direction by diabase and porphyry dikes. There has been considerable faulting and displacement of the sedimentary beds which renders the geological structure more or less complex. However the pronounced faulting offers a very favorable condition for ore deposition.

Two mineralizing dikes traverse the area in an easterly direction; one a diabase dike averaging one hundred feet in width, lying between the granite and the limestone; the other porphyry dike averaging two hundred feet in width, lying between the quartzite on the south and the limestone on the north, along which is exposed the Rattler vein. The porphyry dike caused a faulting of the sedimentary beds, resulting in a drop or displacement of several hundred feet on the north side, and the present position of the limestone which is apparently below and underlying the quartzite.

The porphyry dike is in my opinion the source of the mineralization in the limestone designated as the Queen vein, as well as the source of the mineralization in the Rattler vein. Owing to the fact that the limestone is a soluble rock it offered a favorable condition for the deposition of copper and iron from the mineralized solutions coming from the porphyry dike, and there resulted there from the Queen vein. As the mineralization extended upward from the dike, it follows that it became weaker the further it got from the porphyry dike, consequently, the richer ore bodies are to be expected near the dike, which fact is being proven by the work now being carried on in the Rattler workings;

the deeper work now showing an ore with a higher copper content and less magnetite than the ores found nearer the surface. While large bodies of secondary sulphide ore are to be expected in the limestone beds, the future of the property as a steady producer of copper, depends upon the development of the primary sulphide ores which will no doubt be found below the limestone in the Rattler vein and in the porphyry dike. In view of the extensive body of secondary ores in the limestone the source of which is from the porphyry dike, there is every reason to believe that the primary ores will be very extensive and of a commercial grade.

The diabase dike lying between the limestone and the granite is of later origin than the porphyry dike, and no doubt was intruded after the faulting of the sedimentary rocks. This dike has had very little mineralizing effect upon the adjacent limestone. The dike is, however, very much altered near the surface showing indications of being mineralized below the surface, and it is quite probable that if explored with depth that it will be found to contain primary ores. The old Sisson shaft was sunk on the contact of the diabase and the limestone, and it is reported that low grade sulphide ores were encountered in the bottom of the shaft."

GEOLOGY: West group of claims.

ROY G. MEAD:

"The geologic formation underlying the area embraced by the west end group of more or less complex owing to extensive faulting and displacement, caused by the numerous eruptive dikes which traverse the area. Briefly stated, the formation consists of a basal granite and diabase overlain by a sedimentary series consisting of quartzite, limestone, schist and conglomerate. The diabase occurred in the form in intrusions, and displaced the sedimentary beds. After the intrusion of the diabase the formation was subjected to movement and displacement by faults followed by later intrusions of porphyry in the form of strong persistent dikes cutting the granite, diabase and sedimentary beds. The ore disposition followed the intrusion of the porphyry dikes and its source is traceable to the primary mineralization which came up with the porphyry dikes.

There are no less than twelve porphyry dikes traversing the group, all of which have had an important bearing on the mineralization of the area and with exploration at depth will be found to contain primary copper sulphides in sufficient quantity to be commercial ore under the present modern methods of mining and ore reduction.

The dikes vary from fifty to one hundred feet in width, and in many cases are considerably wider. They are, with few exceptions, nearly vertical, and traverse the property in a general northeasterly and southwesterly direction. The secondary surface ore bodies occur along the contact of the porphyry and limestone, and are known as contact ore bodies when occurring near the porphyry dikes, and replacements ore bodies when occurring in the limestone.

The surface showings and conditions on the property are quite similar to those on some of the principal copper mines of Arizona, such as Magma Mine, Old Dominion and Copper Queen, where rich surface carbonate ores were found in limestone and

other sedimentary rocks, the source of which was traceable to primary sulphide ores occurring at depth in porphyry and diabase dikes."

GEOLOGY:

G. G. WALD:

"The country rocks are quartzite, limestone, diabase, porphyry and granite. The overlying sedimentary formations have been shattered, faulted and tilted by the intrusion of the porphyry and later, of the diabase. These eruptive rocks were intruded, in places, into the bedding planes of the sedimentaries, and also followed up planes of weakness developed at angles to the bedding planes. These fissures and dikes strike generally in a northeast to southwest direction. There is one marked exception to this general rule, the Climax fault, which strikes N 10 degrees E, and dips 60-65 degrees to the NW, cutting the numerous NE-SW faults at angles varying from 45 to 60 degrees. The Climax fault is a strong fissure; on the Climax No. 3 a width of 30 feet between well defined walls was measured. Just north of here the fault swings around into the northwest and widens out. The space between the walls is filled with crushed drag from the quartzite and lime beds it cuts, and both porphyry and diabase have been intruded into the fault. On the surface it is strongly iron stained, and at many places shows stains and stringers of copper carbonate. At the point at which the shaft is located the fault material is especially well leached and koalinized; further to the north the outcrop is more siliceous.

The fissuring and faulting of the sedimentary formations by the intrusion of the igneous rocks has created an ideal condition for the deposition of minerals from mineral bearing solutions. The values consist of carbonates and silicates of copper, and chalcopryrite and chalcocite, the sulphides of copper. As far as developed, this mineralization has been found to consist of replacement ore bodies in the sedimentary beds adjacent to faults of intrusive dikes, and of contact ore bodies between igneous rocks or between an igneous rock and the sedimentary deposits. The ores were deposited from vapors and mineral bearing water accompanying and emanating from the igneous intrusions. In this section the porphyry and diabase are both mineral carriers and mineralizing agents. Note the Magma mine, where the ore body is associated with porphyry dike intruded into a fault fissure cutting the sedimentary beds. The diabase is not as favorable for ore deposition, but at Globe and Ray, sulphide and oxide ores have been found in the diabase, usually as a contact.

Development, to date, has disclosed several mineralized areas almost exclusively on the NE-SW veins and faults. The Buckeye, Alice and Rattler-Sisson workings are examples of this ore occurrence. Although considerable ore was shipped and smelted, the ore bodies were of low grade and of limited extent.

Pratt Tunnel; On the Pratt tunnel dump a pure crystalline quartzite, with disseminated values in chalcocite, was found. The tunnel is now inaccessible, and no assay maps are available, at the mine. The map shows that two beds of the brecciated quartzite were crosscut near the end of the tunnel; the first, 30 feet wide, was drifted on for 120 feet, and the second 260 ft.

wide, was drifted on for 80 feet. It is reported that this quartzite ran 2 % copper; and the fact that the drifts were driven on the quartzite, and at no other part of the tunnel, indicates that encouraging values were encountered. However, at that time ore of 2 % copper content had no commercial value. This quartzite ore could be cheaply milled, and as it will have a high ratio of concentration, would be pay ore today, if a sufficient tonnage was developed. A sample taken of this quartzite on the surface of the dump ran trace copper; a second taken below the surface, where values had been concentrated by surface waters since the rock was mined, ran 5.1 % copper. These samples merely show that there is copper in the quartzite. If the old assay maps or data are extant, and show the copper values reported, it would pay to open up the Pratt Tunnel, as there is a possibility here of developing a considerable tonnage of low grade ore."

GEOLOGY:

JOHN C. DEVINE

"The formations consist of limestones, quartzites, granite, diabase, and porphyry. The latter eruptives occur in the form of intrusions, having caused minor displacements in some instances of the over lying sedimentaries. These displacements are usually marked by distinct brecciation, and ore deposits of varying degree of importance are in evidence along these lines of faulting.

Massive outcrops of iron gossan mark the proximity of the mineralized portions on the western half of the property, and on the eastern half, large bodies of magnetic iron are found closely defining the mineral zone."

DEVELOPMENT:

LEO VON ROSENBERG:

"The development done by the former company, consisting of several shafts, a number of levels, tunnels, etc., was largely ill advised. It is of no particular importance, and probably will be of little use in future operations.

A new plan of development has been inaugurated.

Recently a new shaft was started in Climax 2 claim, situated on the south slope of Climax Hill. This shaft has reached a depth of 80 feet. It is in the meta-diabase. The territory embraced by the south slope of Climax Hill shows many prominent croppings of hematite. Judging from these surface showings, and from the openings already made, it is reasonable to expect that by further development large bodies of valuable copper ore will be opened up, in this part of Climax Hill. It is reported that a considerable amount of very rich ore was taken from the shallow workings of Climax 3 claim, and also from the Copper Glance claim. Assays of a number of samples taken from the various openings on Climax Hill showed good copper values.

A new shaft was started on the California claim, situated on the east slope of Climax Hill. This shaft is now 100 feet deep. It is a meta-diabase. In the bottom, the material is heavily mineralized, showing iron pyrite. The shaft should be sunk about two hundred feet deeper, cross cuts should then be run about 500 feet northwesterly and about 200 feet southerly.

Judging from the surface indications, consisting of heavy gossan (hematite and limonite) about six veins should be intersected by these cross cuts. It is reasonable to assume that some of these veins will be found to carry workable copper ore in quantities. When the veins have been opened up, levels should then be run on them in a southwesterly direction; ultimately these levels should be connected by cross cuts with the new Climax 2 shaft.

It is reasonable to expect that with the development recommended, a large copper mine will be opened up in Climax Hill."

THE RATTLER MINE:

"The vein of the Rattler is reached by a short tunnel driven in a southerly direction, mainly through diabase and lime. The vein is intersected at a point 150 feet from the mouth. The workings consist of various drifts and a number of large, irregular chambers from which ore has been extracted. The vein is exposed in most of the workings. It lies at an angle of about 20 degrees, dipping to the south. The thickness of the vein varies from 2 to 8 feet. The ore is magnetite. There are a number of faults or slips. Apparently several veins course through the Rattler claim.

According to the assays of a number of samples taken from the ore exposures, the ore carries from 2 to 9 % copper; 30 % silica; 4 % sulphur; 32 % iron oxide; 10 % magnesia; some alumina and a small amount of lime. The returns of ore shipped in quantity several years ago to the Humboldt smelter, near Prescott, Arizona, show on the average as follows;

Copper 3.5 %; Silica 30 %; iron 24 %; lime 0.5 % sulphur 3.8 %.

Thirty-two tons of sorted ore shipped as a test, in January 1914, to the smelter of the American Smelting and Refining Company at Hayden, Arizona, contained;

Copper 5.22 %; iron 30.8 %; insolubles 19.2 %.

The gold and silver contents of the ore amount to about \$1.50 per ton.

The indications are that even with a comparatively moderate amount of development work, a considerable tonnage of this class of ore could be made available. The workings of the old Sisson mine, the shaft of which is about 400 feet west of the Rattler mine, are not inaccessible below the first level. On this level, at the shaft, a very strong vein of red hematite is exposed. The surface showing in the eastern part of the Copper Reef claim adjoining the Rattler claim on its west end line, is exceedingly favorable. The cropping of rich ore should be followed by an incline. With a moderate amount of prospect work, very likely quite a tonnage of rich ore could be extracted. The vein exposed by the croppings is no doubt a continuation of one of the Rattler veins.

It is reported that very good sulphide ore was encountered in the lower Sisson mine workings. This class of ore, mixed with copper bearing magnetite would make a good smelting product.

The development proposed might be supplemented by diamond core drilling."

DEVELOPMENT: (West group of Claims)

ROY G. MEAD:

"The Alice vein traverses the Dime, Alice and Maggie claims, and is a contact vein having a limestone hanging wall and a granite porphyry dike for a footwall. The general strike of the vein is about north sixty degrees east, and the dip about forty-five degrees to the northwest. The vein filling is iron oxide accompanied with copper carbonate ores and altered porphyry. This vein has been explored to a depth of about 350 feet by means of the Alice incline shaft and the Pratt tunnel, and a large tonnage of carbonate ores extracted, which had a copper content in excess of ten per cent. The development work on this vein, while quite extensive was done for the purpose of extracting the carbonate ores, and not with a view of developing the primary ore bodies; therefore, sufficient depth has not been attained to reach the primary ores.

In the Pratt Tunnel, which reached a distance of 2300 feet, sulphide ore in shattered quartzite was encountered at a distance of about 1600 feet from the portal and at a vertical depth of about 500 feet. The mineralization consisted of fine particles of copper sulphide and native copper extending over 50 feet in width near the granite porphyry dike, the average copper content being about 2.5 per cent. This mineralization is undoubtedly the Alice vein exposed at a depth below the limestone, and the mineralization in the quartzite is traceable to the granite porphyry dike. The fact that the values are in the quartzite is conclusive evidence that further depth is required in order to reach the primary sulphide ores. The ore developed in the tunnel, is however, at the present time, commercial ore, although when the tunnel was driven several years ago it was considered too low grade, as at that time, the possibility of mining low grade copper ores was not an established fact.

The Alice shaft follows the vein filling between the limestone and porphyry and the ore deposits encountered are typical of the secondary ores worked in the early days by the principal copper mines, which are today getting their output from primary sulphides in porphyry. There is no record of the tonnage of carbonate ores obtained from the workings, and the shaft is now inaccessible. A map compiled by the writer several years ago when the ore body was exposed is a geological section of the ore exposure of the shaft at the third and fourth levels. The ore exposed at that time was high grade and assayed from six to twelve per cent.

The fact that the mineralization near the surface in the limestone is so pronounced together with the fact that there is a large area of mineralization in the quartzite, now commercial ore, exposed in the deeper workings, is conclusive evidence that the porphyry will be found to contain workable deposits of primary sulphide ores when developed below the leached zone. The surface showing, together with past development work, warrants systematic exploration, which in my opinion will lead to the development of a large producing copper mine."

DEVELOPMENT:

JOHN C. DEVINE:

"For convenience in the discussion of the development I shall divide the property into two groups, viz; the East and West end.

Taking up the east end of the group, the Rattler vein is found traversing the group and prominently outcropping for a distance of several thousand feet. Deposits of low grade ores are in evidence at several points along the outcrop, and on the Rattler claim, whereat most of the development has centered, a large body of magnetite has been opened that carries copper values ranging from 2 per cent to as high as 5 percent.

Considerable ore has been shipped from this deposit and more is available for shipment at this time.

The vein of magnetite lies on a diabase foot-wall and beneath an altered limestone hanging wall, the values below the oxidized zone consisting of finely divided particles of chalcopyrite and bornite very evenly disseminated throughout the entire mass.

The development as it stands today has exposed considerable ore of milling grade and some more that could be shipped at a profit.

Continued development to the west closely following the ore strata would undoubtedly open an extensive body of commercial ore.

The ore now developed on this end of the property and probable ore than can be readily added to the reserves by following the ore on the 2nd level of the vertical shaft, places this property in the position wherein immediate shipments can be started.

Thousands of tons of low grade milling ore in the mine and stock piled on the surface offer immediate opportunity for the first unit of a reduction plant, and it can therefore be stated that this end of the property has passed beyond the prospective stage of development, and with little expense it could be placed in the producing class. Proper experiments should be made in order to determine the best and most efficient process of recovering the copper values from these low grade ores. In view of the high percentage of iron or magnetite contained in the ore the writer believes that separation by magnetic attraction, will give satisfactory results. If flotation seems necessary this unit could easily be added afterwards.

Taking up the west end of the property which embraces all of the area west of the camp, we find the development well advanced, and with comparatively limited further development this end of the property could also be made to produce ore, the volume of which would depend entirely on the magnitude of operations.

Traveling west from the camp we come first to the Climax shaft which is equipped with a hoist and compressor and has reached a total depth of five hundred feet vertically. This shaft was designed to explore what is known as the Climax fault, an intrusion of porphyry, forty to fifty feet in width, carrying copper values in the oxidized zone in the form of carbonates, and evidencing a very much leached condition and indicating that when the primary zone is reached high grade copper should be found quantity.

The prominent features of this fault are its strength and regularity, traceable on the surface as it is for a distance of more than two thousand feet. Copper values are to be seen along the fault at several points where surface work has been done.

The shaft was started in the porphyry but left it within the first hundred feet, the porphyry having pitched sharply to the west. At the five hundred foot level a cross cut was started to cut the porphyry, but this work never reached the contact due to the suspension of operations. It is estimated that 150 feet of drifting will cut the vein. This work should be completed and the shaft should be sunk 225 feet deeper and a drift started to the west with the ultimate purpose of exploring the very favorable ground lying between the Climax shaft and the Alice mine.

The approximate cost of finishing the development at this point as above indicated would be about \$20,000 and the work could be accomplished in from three to four months after the shaft was unwatered.

The next development of importance on the west end of the property is centered on the Alice and adjoining ground, and is very extensive. However, due to a long period of idleness considerable of this work is inaccessible at this time. Much ore has been mined from this part of the property, mostly high grade copper, and in the writer's opinion a big mine will be the inevitable result of intelligent development through the Pratt tunnel on the west end of the group.

The Pratt tunnel which was driven a total distance of about two thousand feet some years ago, has opened up some very good ore in two different places. The elevation of this tunnel is about 250 feet deeper than either the Climax or Alice shaft, and just brings the development to the primary zone where both primary and secondary sulphides are in evidence quite abundantly. The tunnel cut two distinct ore veins, one known as the Klondyke vein measuring four feet in width and averaging about 2 per cent copper. Very little work was done on this vein due to the low tenor of the ore which at that time was not considered commercial. The evolution of metallurgical processes however has demonstrated that low grade ores can be made profitable by applying the modern methods of concentration and flotation.

A second area of low grade sulphides was encountered 400 feet east of the Klondyke vein and this was cross cut a total width of 150 feet. The ore here was not developed to any extent either, due to the above reasons. In both instances the ore occurs in a much shattered and brecciated quartz formation, and a fine separation of the values could be obtained by concentration with a very high ratio of recovery.

This part of the property offers a better opportunity than any other for the opening up of a mine of large proportions, and there is no doubt in my mind that any development extended to the east from this tunnel following the present low grade ore, will from time to time encounter deposits of high grade ore the existence of which was fairly well determined by the work done from the Alice shaft.

The work done on the eastside of the Alice shaft on the lowest level cut a porphyry fault running somewhat across the general trend of formations, and it is this fault that produced some very high grade ore and appeared to be making downward with increasing strength. It would require driving the Pratt Tunnel five or six hundred feet east in order to cut this ore, and considering the pitch of the ore body a stopping backing of about 400 feet would result from this development. An approximate estimate of the cost of reopening the Pratt Tunnel and driving east to the ore above mentioned would be about \$20,000, which amount includes some equipment, and the time required would be about 7 months."

ECONOMIC CONDITIONS:

JOHN C. DEVINE:

"The property is so situated with relation to the railroad that transportation facilities should be ideal. The embarking point could be located at Erman Siding, one and one half miles east of Ray Junction and thus reduce the distance from the railroad to the mines to five miles. Cheap transportation could be obtained by the use of motor trucks and trailers.

It has been suggested in this connection that an aerial tramway might be considered to deliver supplies to the portal of the Pratt tunnel and transport ore from this end of the property to the railroad. The project is entirely feasible and the distance would be reduced to three and one half miles all down grade to the railroad.

The proximity of the Hayden Smelting plant, a unit of the American Smelting and Refining Company's string of smelters, which lies about fifteen miles east of the property is an economic factor of more than ordinary value. The short railroad haul together with the efficient method of transporting ores and concentrates that could be developed, would contribute largely to the profitable marketing of the low grade ores now available on the property, which have heretofore not been considered commercial due to inadequate transportation facilities."

CONCLUSIONS:

LEO VON ROSENBERG:

"It is reasonable to expect that with the development recommended, the existence of large quantities of workable ore will be demonstrated.

Altogether the future of the property is very bright. It must be borne in mind that the condition of a number of copper properties, which are now large producers, was at one time not at all as encouraging as is the present showing at the Troy mines.

The Troy Arizona copper property forms a very attractive mining proposition, which with proper development, has every promise of becoming one of the great copper producers of Arizona.

A few weeks ago I visited the property for the third time. After another examination of the property, I am still more convinced of its great possibilities. There can be developed at least three if not more, great copper mines. One or two great mines will be opened up by the development proposed on Climax Hill. The Copper Glance itself will become a great mine. The showing on Climax Hill is most promising, and it is surprising that this part of the property has been so long neglected.

The claims southwest of the Tiger can also be expected to contain workable ore bodies.

I am convinced that by the development proposed to be done on the Manhattan group, large and profitable ore bodies will be opened up.

I will not go into details, but I must state that I am much impressed with the great possibilities which the property possesses and I urge that drilling and other development recommended in my report of last year be begun as soon as possible. With an expenditure of from 100,000 to 150,000 dollars several great copper mines will be opened up on the property."

CONCLUSIONS: East group of Claims

ROY G. MEAD:

"In my opinion the future of the property is very bright, and with well directed development work large bodies of secondary sulphide ores will be developed in the limestone, which in itself will make the property a very large producer of copper. In addition, extensive bodies of primary sulphide ores will be developed by exploring the porphyry dike and the Rattler vein at a sufficient depth below the surface."

CONCLUSIONS: West Group of Claims

ROY G. MEAD:

"All of the previous development work on the property was done with the end in view of obtaining carbonate ores. This was a time when ore carrying less than 7 per cent copper was considered unprofitable to extract, and before the time of working low grade primary sulphide ores. The history of the property is quite similar to numerous other properties in Arizona, all of which are now on a steady producing basis, drawing their output from the primary sulphides encountered in the deep-seated eruptive dikes. With the favorable surface showing on this property and its similarity to the other prominent copper properties in Arizona, I feel justified in my opinion that proper development work will result in a large producing copper mine."

CONCLUSIONS:

G. G. WALD:

"The property lies in the mineral belt of the South West, and surface indications and geological conditions are favorable for the mineralization of the Climax vein, especially at its intersection with the various NE to SW cross faults. The fact that the faults intersect at acute angles is a favorable condition as the zone of shattering is larger than if they cut at right angles. These shattered zones, and also the limestone beds are most likely to contain ore bodies.

The leached zone will be found to be comparatively shallow and the highest grade ore will be found at the water level at the point of transition from oxidized to sulphide ores.

Revenue could doubtless be derived, and cheap development obtained, by letting leases on the carbonate ores exposed on surface and in old workings."

CONCLUSIONS:

JOHN C. DEVINE:

"In conclusion it is to be noted that with the expenditure of an amount somewhat less than \$100,000 on the east and west end of the property combined, the proposition will be converted into a steady producer and in consequence ample justification for a more elaborate plan of operations will inevitably follow.

The limit or volume of ore that could be mined here once the property is properly opened up should be very extensive, and judging from a comparison of the formations here with those of other large producers in the district, mining costs could be maintained as low or lower than those of any other property now producing on a large scale. Due to the possibility of considerable high grade ore running 10 per cent or better being encountered on cross faults throughout the area, it can be stated beyond the adventure of a doubt that commercially the property will average better than 5 per cent on a very large scale of operation."

File #

Troy - Alice Tunnel

Mineral Creek or Banner Dist
Pinal County - Gila County
ARIZ

Expenses

Sample sacks

food

Vehicle @ 10¢/mile

Misc. supplies

150/day + expenses
Geologist & Miner

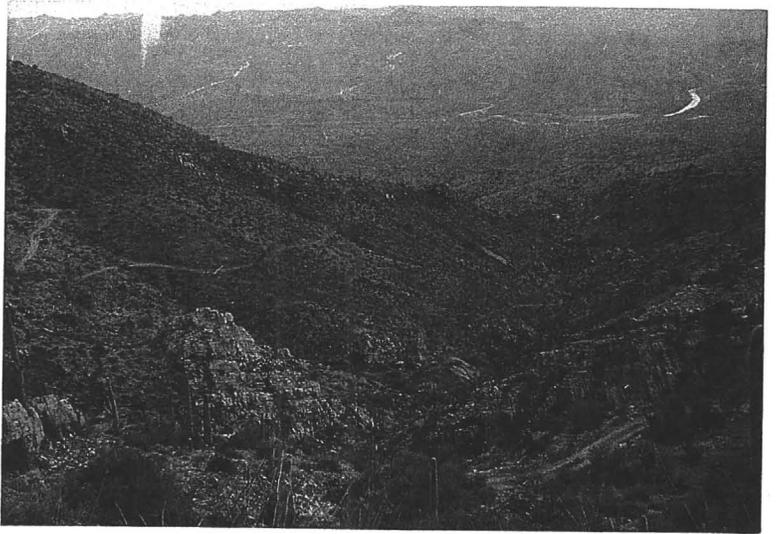
50/day for 2 helpers

200/day x 10 days

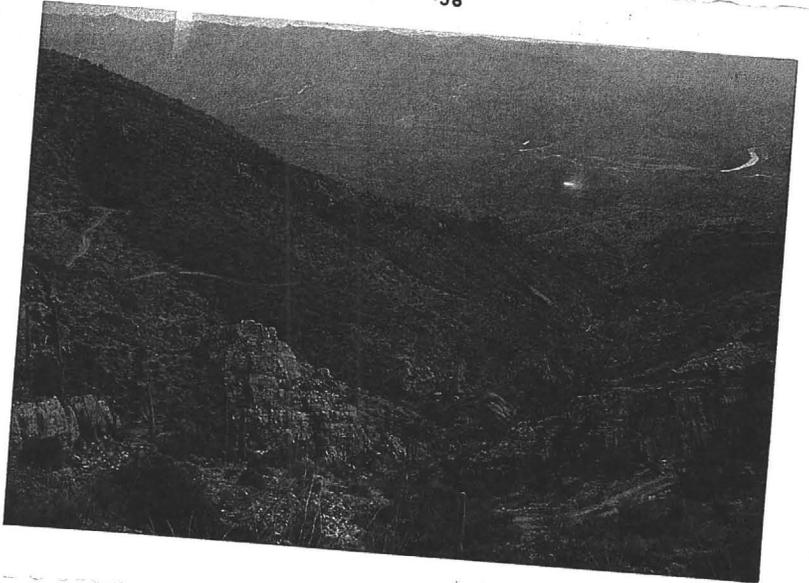
est. cost \$ 2000.00

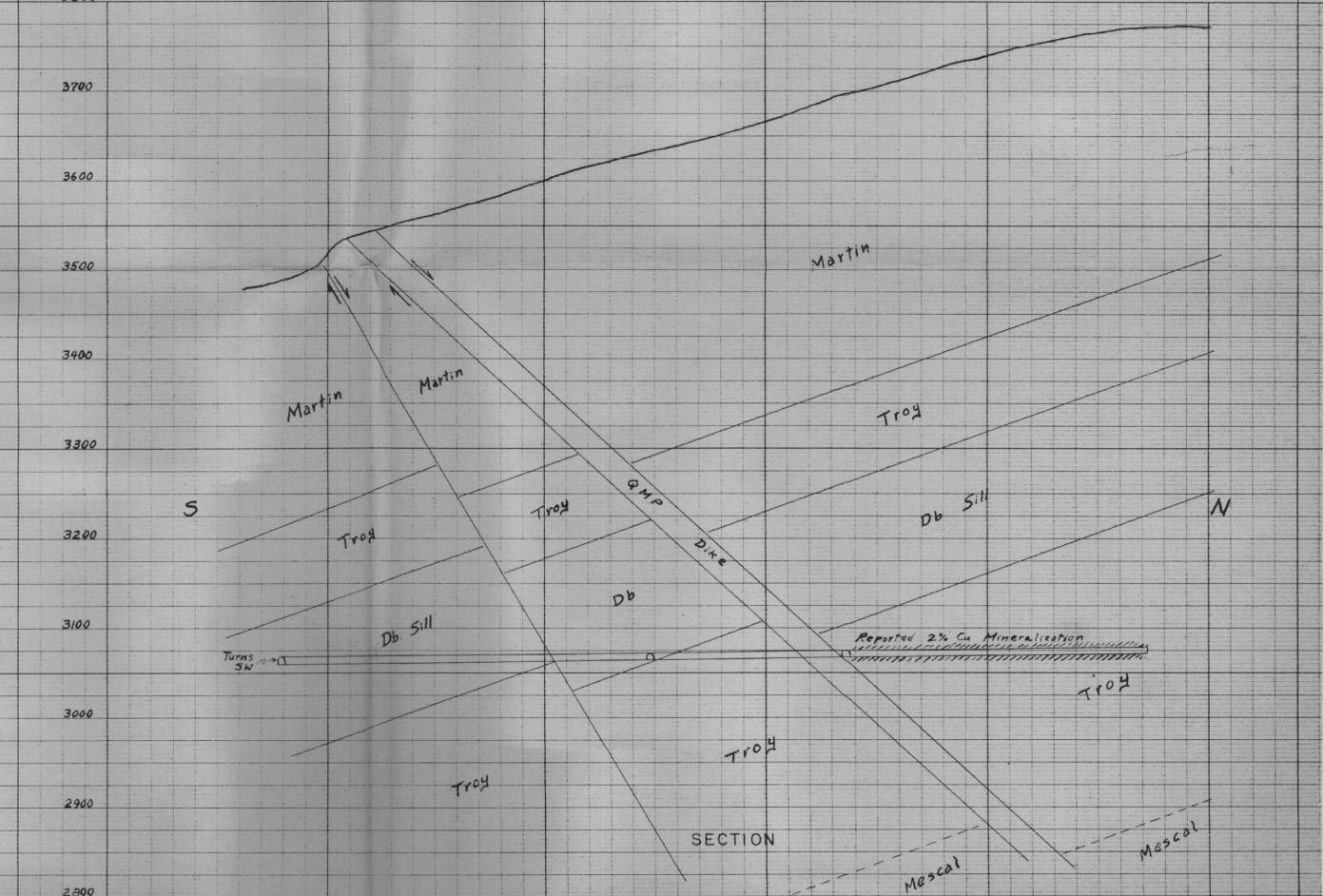
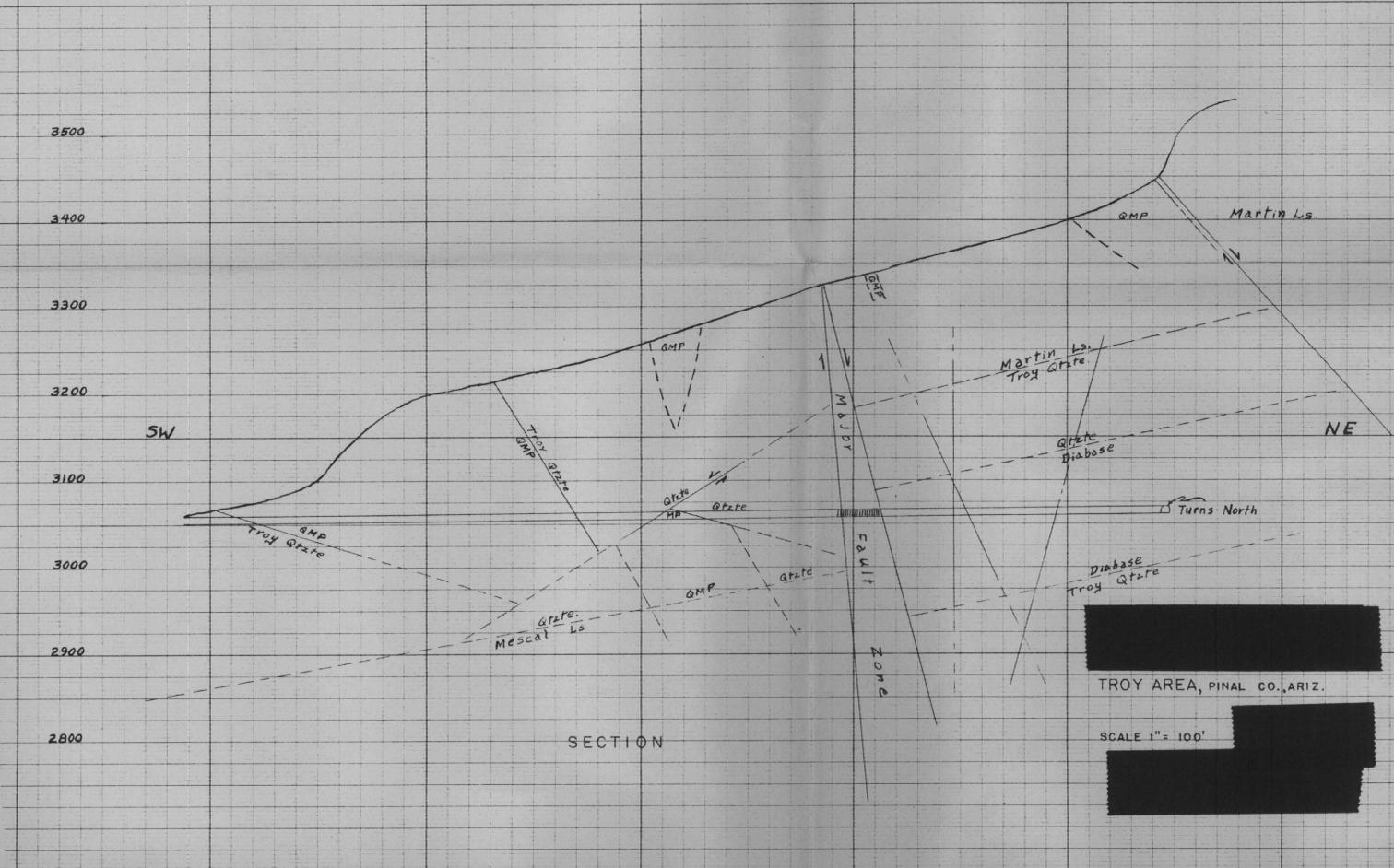
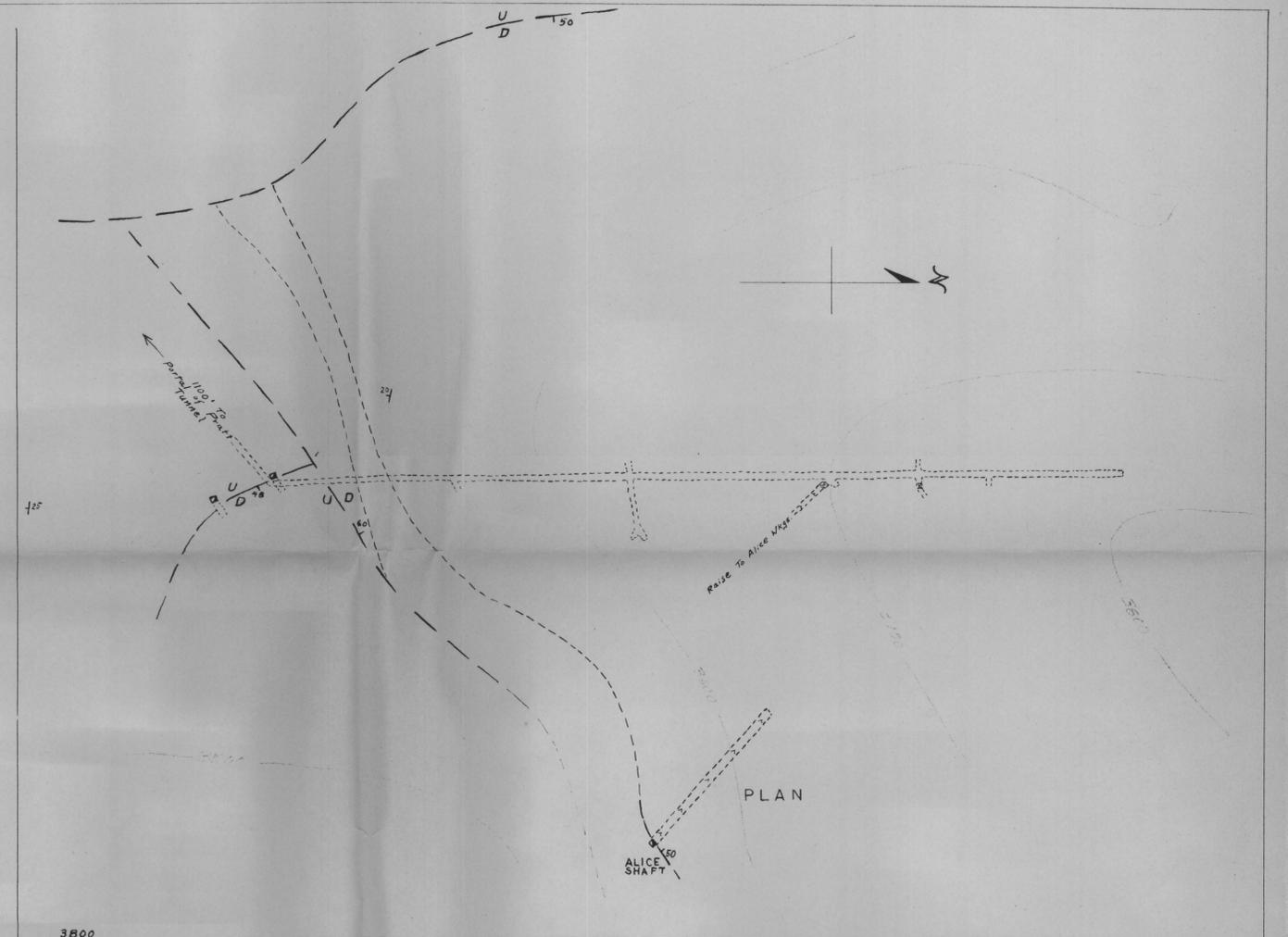
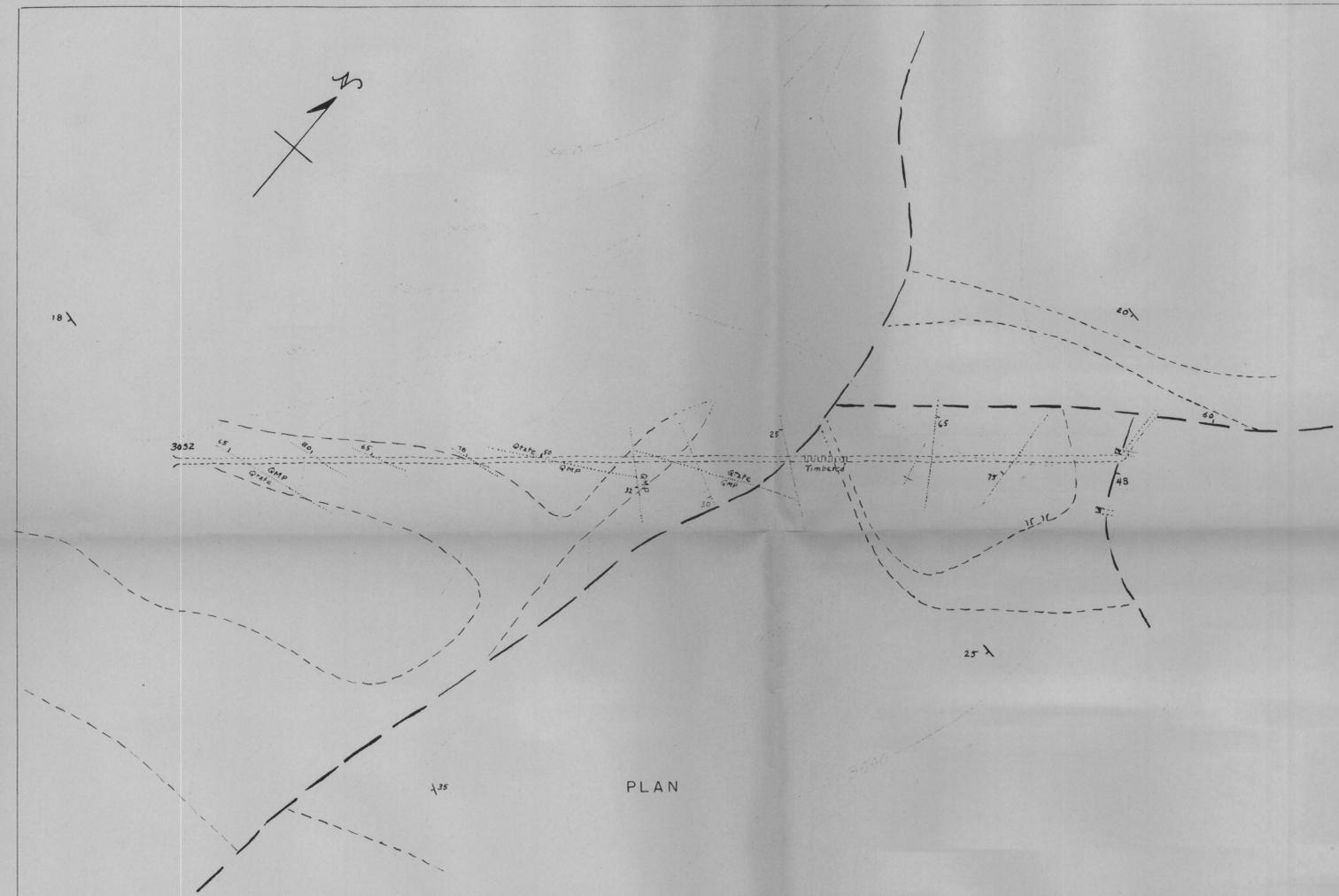
+ expenses

APR • 58



APR • 58





**GEOLOGICAL MAP
OF
PART TUNNEL**

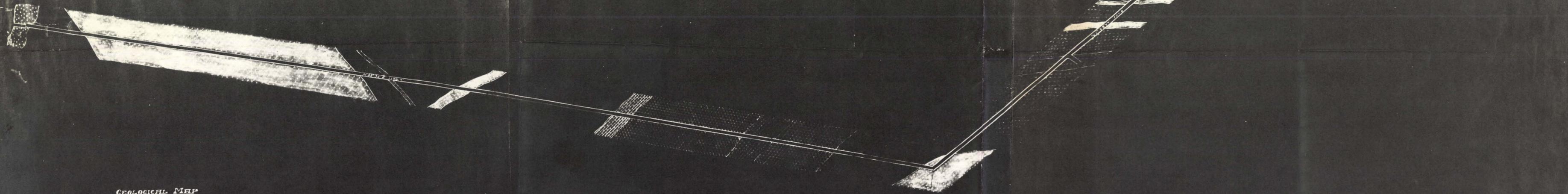
- | | | | | | | | | | |
|------|-----------|-------|-------|--------------|----------------|--------|-----------|-------|-------|
| | | | | | | | | | |
| CLAY | QUARTZITE | SLATE | SHALE | CONGLOMERATE | LOOSE MATERIAL | GRAVEL | QUARTZITE | SHALE | SHALE |

SCALE 1:1000
HORIZONTAL

Zone 2

Zone 1

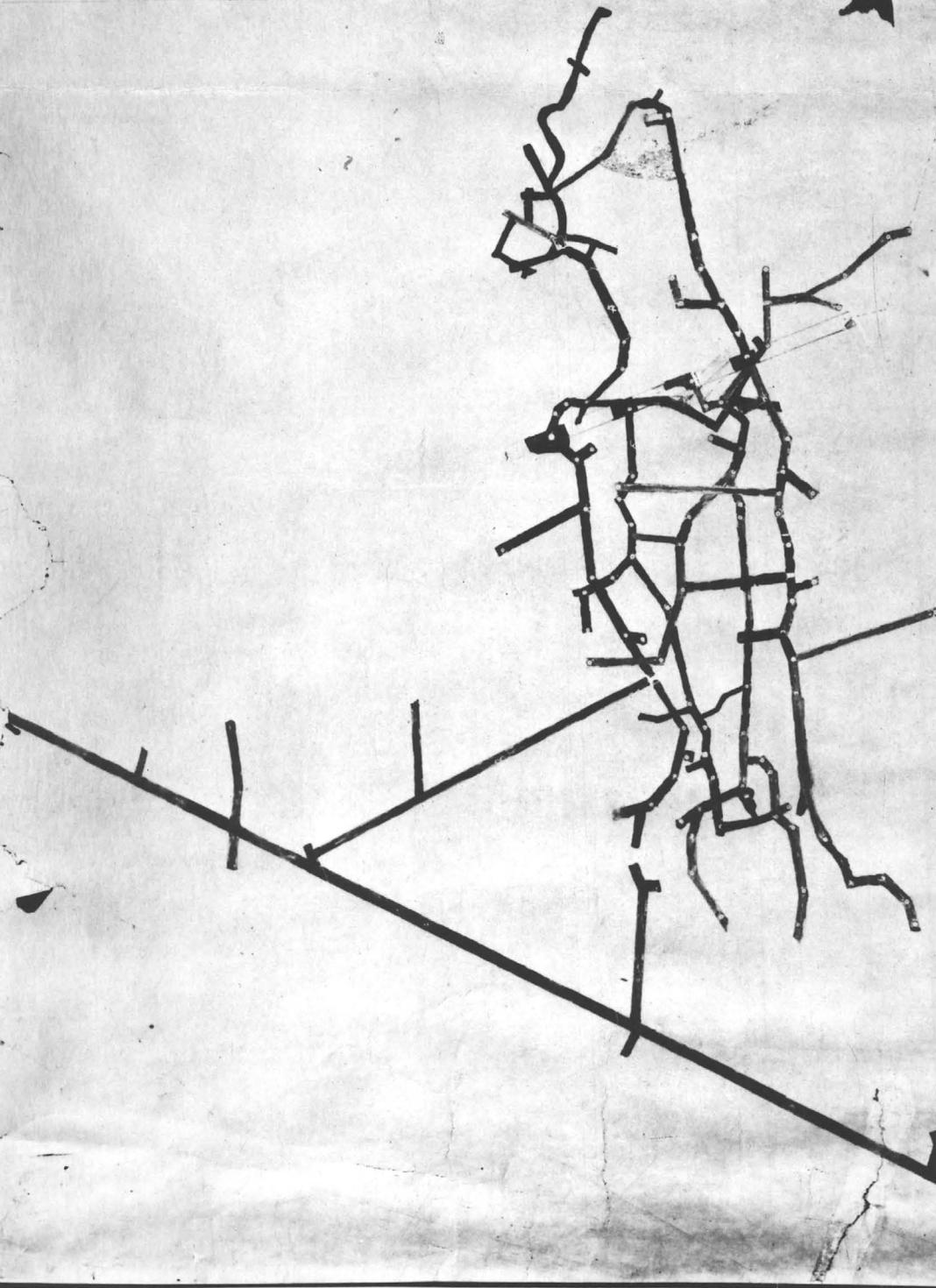
Georex



WINZT

SURFACE STOP

Alice Mine.
Scale 50 feet to an inch.



SAMPLE N°

1
% COPPER 0.40; OZ. / TON SILVER 1.0; OZ. GOLD / TON 0.01
88.1% SiO₂ (SILICA)
5 FOOT INTERVAL

23
0.39% COPPER 6 FOOT INTERVAL

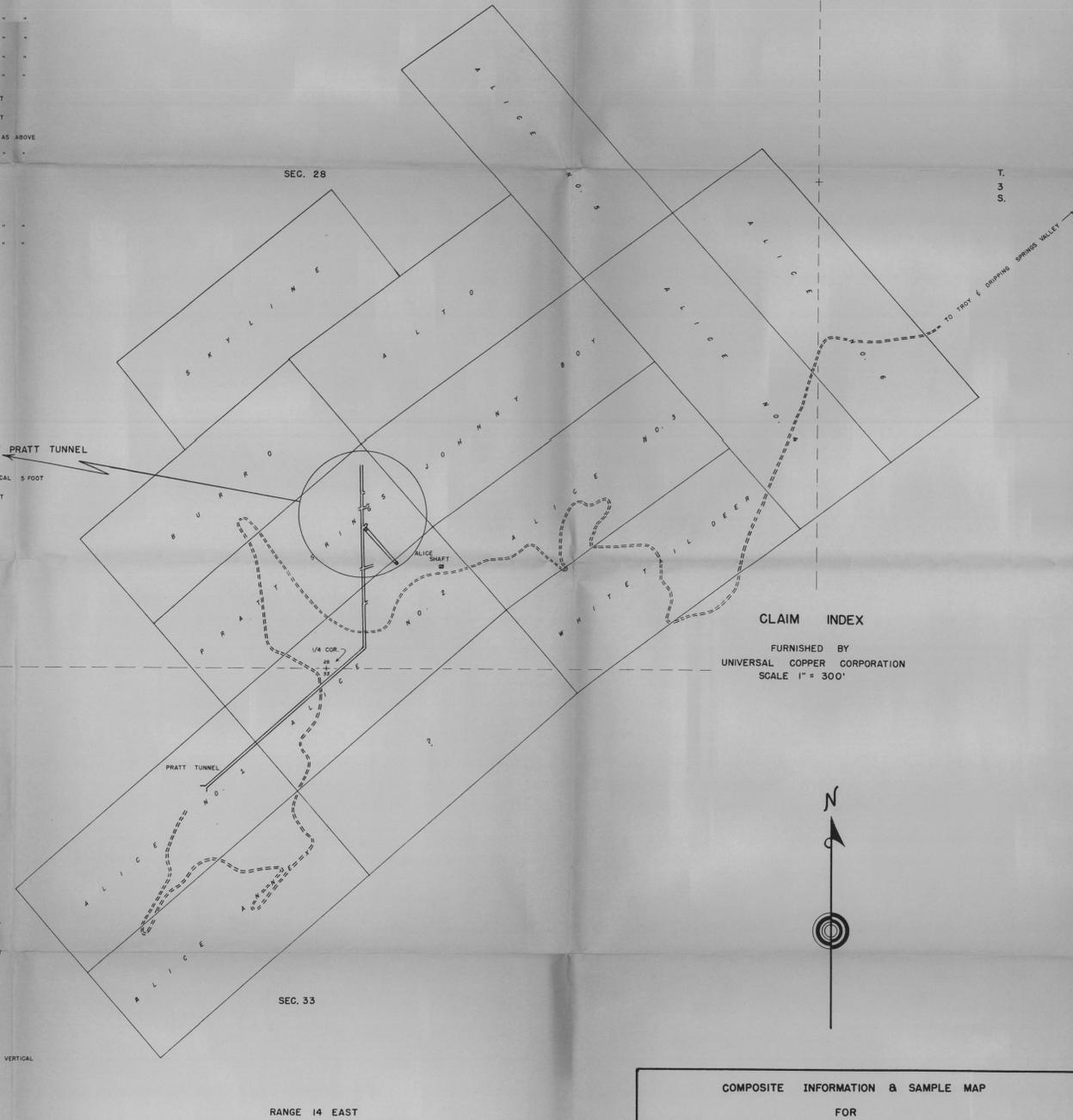
26
0.19% COPPER 4 FOOT INTERVAL VERTICAL

29
0.15% COPPER 5 FOOT INTERVAL

30
0.02% COPPER GRAB

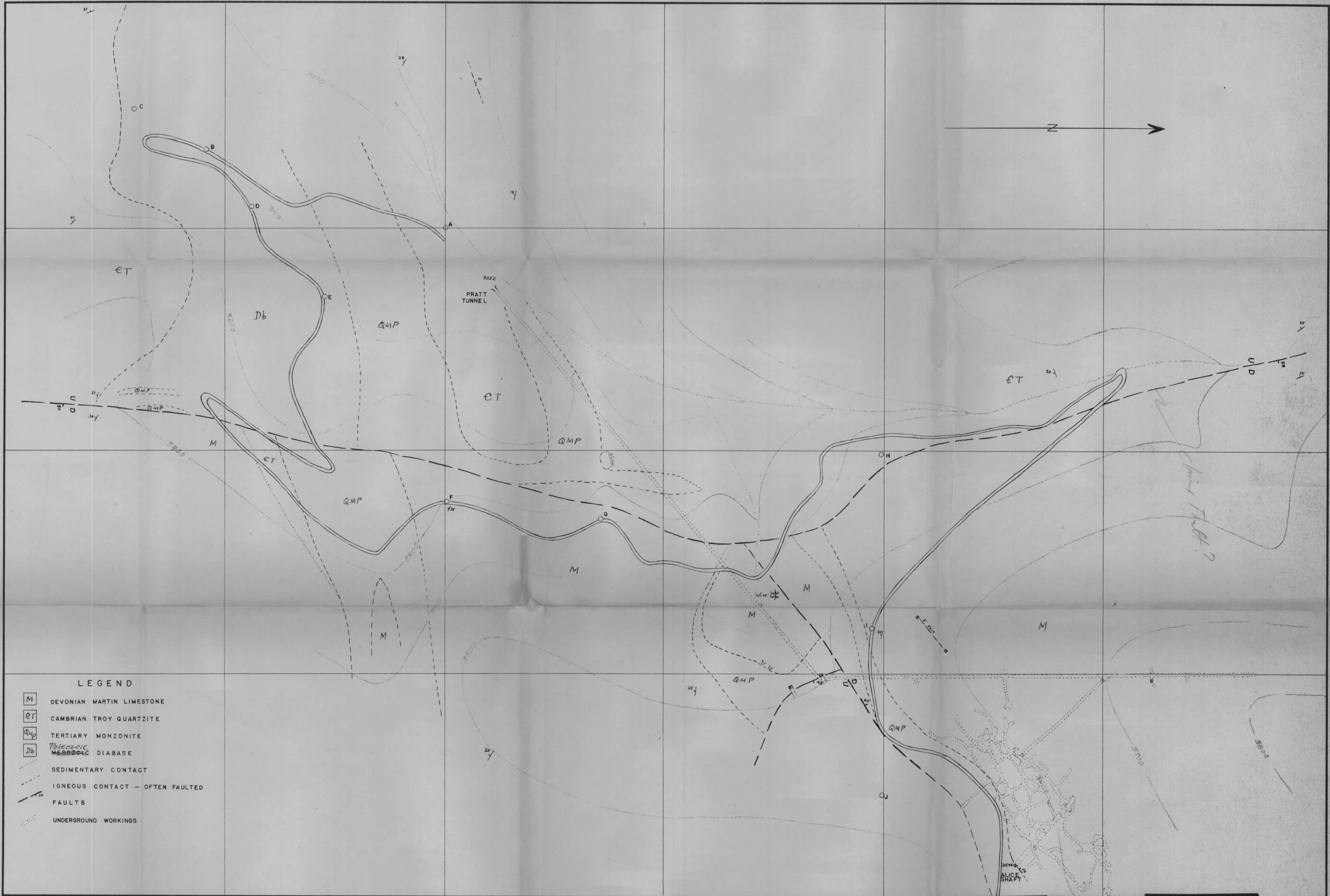
SAMPLE MAP
NORTHERN PORTION
OF
PRATT TUNNEL
SCALE 1" = 20'

SAMPLE N°	% COPPER	OZ. SILVER / TON	OZ. GOLD / TON	% SiO ₂ (SILICA)	INTERVAL
5	0.03				18 INCHES
6	0.32	0.7	0.005	81.2	5 FOOT
7	0.08				SAME AS ABOVE
8	0.32				
9	0.32				
10	0.42				
11	0.22				
12	0.19				
13	0.10				
14	0.12				
15	0.21				
16	0.13				
17	0.17				
18	0.17				
19	0.34				
20	0.14				
21	0.31				
22	0.11	0.20	TRACE	96.0	
23	0.76				4 FOOT
24	0.13				5 FOOT
25	0.52				SAME AS ABOVE
26	0.17				
27	0.57	0.60	0.005	93.8	
28	0.24				
31	0.03				VERTICAL 5 FOOT
32	0.04				8 FOOT
33	0.74	0.20	TRACE		8 FOOT
34	0.05				5 FOOT
35	0.15				4 FOOT VERTICAL
36	0.40	0.60	TRACE	91.2	8 FOOT



COMPOSITE INFORMATION & SAMPLE MAP
FOR
UNIVERSAL COPPER CORPORATION
WEST TROY CLAIM GROUP
DRIPPING SPRINGS MINING DISTRICT
PINAL COUNTY, ARIZONA

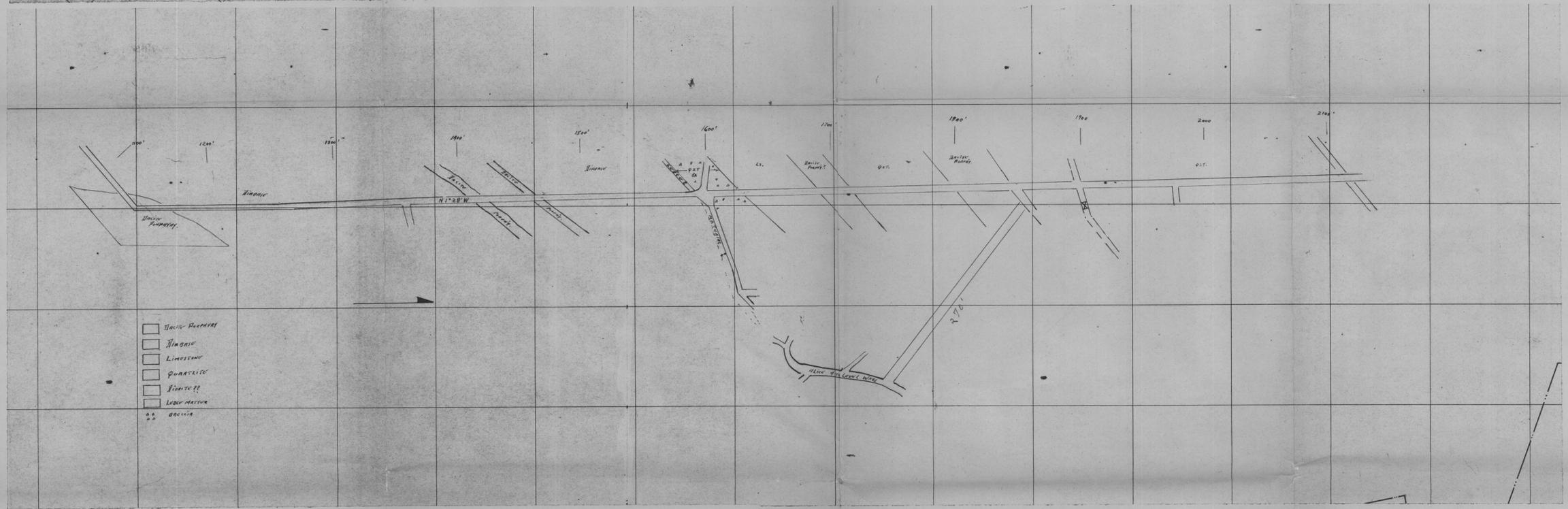
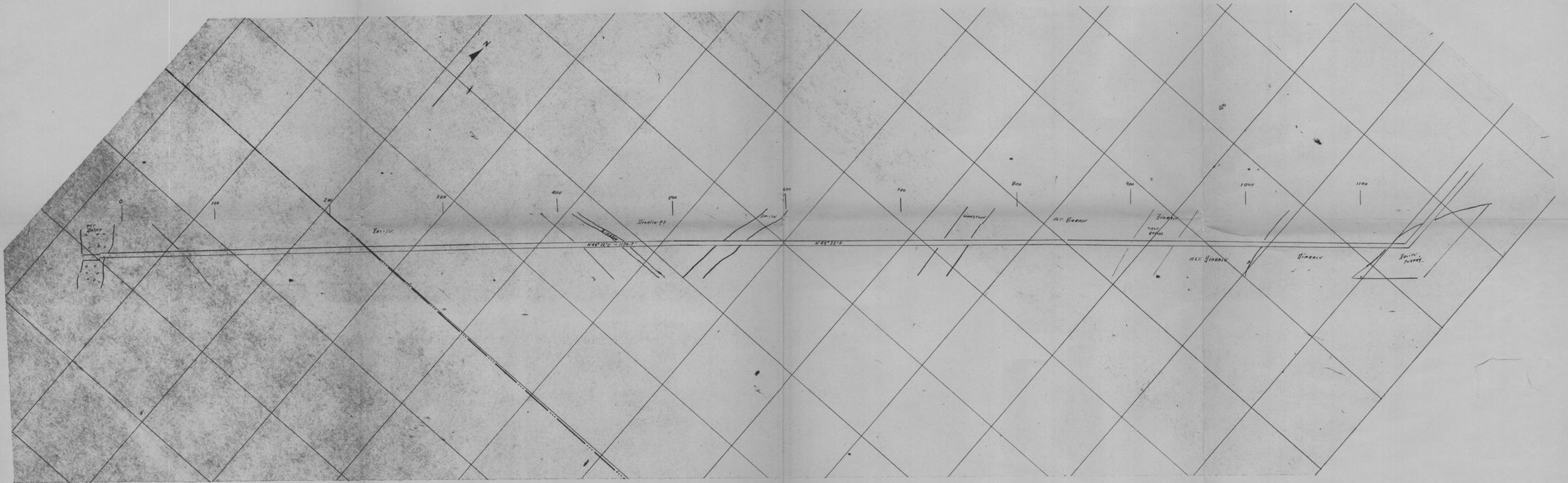
BY
HEINRICHS GEDEXPLORATION CO.
P.O. BOX 5671 4/30/59 TUCSON, ARIZONA



LEGEND

- M DEVONIAN MARTIN LIMESTONE
- ET CAMBRIAN TROY QUARTZITE
- QMP TERTIARY MONZONITE
- Db ~~PRELIMINARY~~ MESOZOIC DIABASE
- SEDIMENTARY CONTACT
- - - - - IGNEOUS CONTACT - OFTEN FAULTED
- FAULTS
- UNDERGROUND WORKINGS

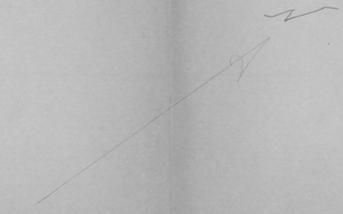
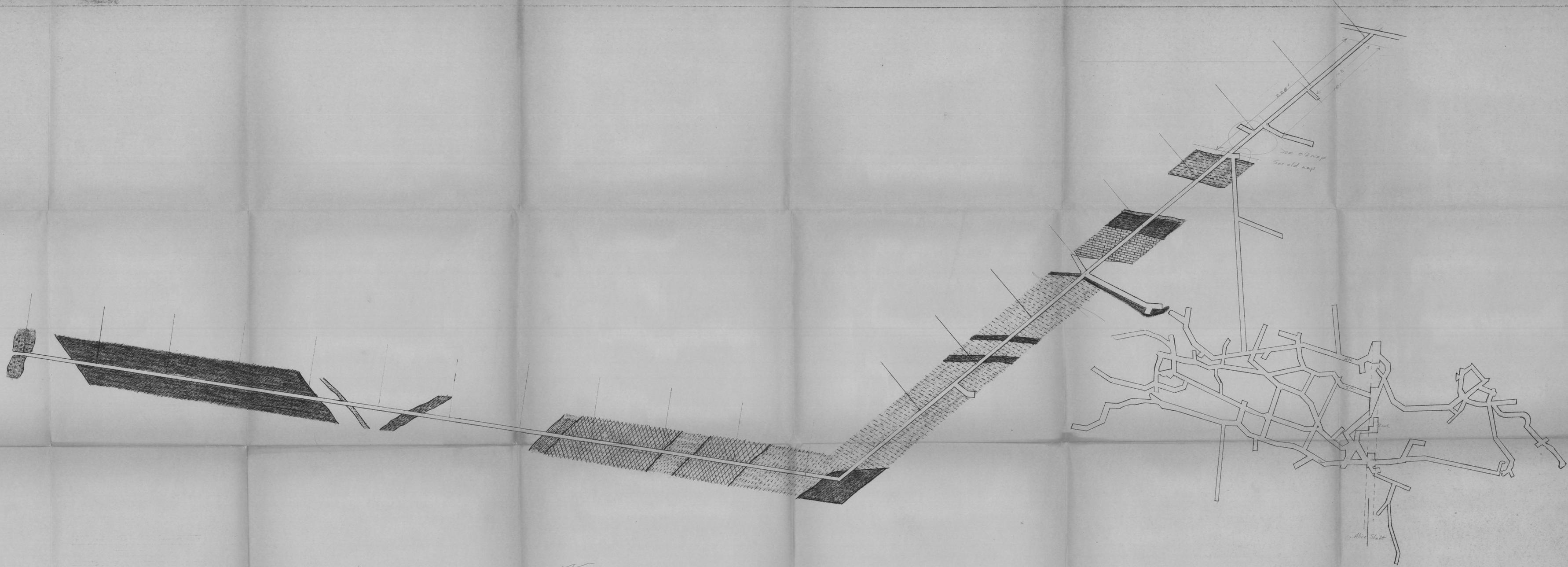
PLANT UNIT No.	REVISION		BLOCK
DRAWN	DATE	TROY AREA, PINAL COUNTY, ARIZ.	
		SCALE - 1" = 100'	COORD -
		DATUM	DRAWING No.



280 acre -
14 claims -

PRATT TUNNEL

PRATT TUNNEL



Ray G Mead Consulting Eng. & Geol. Dept. of Interior 1905-1910

Dripping Springs

150'

Pratt Tunnel & Alice Workings
Troy File
Dripping Springs Mag. Dist



5 May 1958

ARIZONA, PINAL COUNTY, MINERAL CREEK (Ray, Kevin) DISTRICT

Old Alice Mine, Troy Tunnel

First showing of mineralization was 1600 feet in from the portal. At this point, a drift was cut, both right and left. Oxide and sulfide mineralization.

Sample grabs taken every 3 feet. Following assays were samples taken going into the tunnel:

0.18 %Cu
0.20
0.94
21.25
7.54
7.95
3.41

Assays from left drift: from tunnel in: 4.73 %Cu
5.70

Assays from right drift, from tunnel in: 5.14 % Cu
5.14
5.00
1.47
0.42
2.42
2.01
2.12
3.04

Above data via Larry D/'Antonio

Jim Kelly, Anaconda Mining Co., reports their assays over 3 to 4 feet width, ran a maximum of little over 1% Cu on chalcocite stringers up to maximum of 1-1/2 inches wide in shattered quartzite in contact with diabase.

WEH

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shattered quartzite in contact with diabase.

WBH

PRATT TUNNEL

4-21-59
Rough chaining w/Nato

Portal to 390	Dacite. Possible break at 390?
390 to 485	Dacite. Contact at 485. Diabase?
485 to 559	Diorite?
559 to 620	Timbered. Dacite
620 to 762	Last point at which daylight can be seen is 762. Beds N76E, dip 15SW. Tunnel N45E. Limestone.
762 to 822	Timbered with "S" bends. Altered diabase.
822 to 861	Altered diabase.
861 to 1030	Fault material? or diabase.
1030 to 1100	Diabase.
1100	Turn in Tunnel. This is a newer cut as older one is caved.
1100 to 1135	Dacite porphory
1135 to 1153	Timbered.
1153 to 1202	Turn into old tunnel at 1202. Head N 1°W. Diabase.
1202 to 1238	Diabase. At 1238 break or contact. West or hanging wall is N5E, dip 75W. Slickensided
1238 to 1276	Fault contact? Hanging wall S 50E, dip 25SW. Probably small slip.
1276 to 1315	Diabase. S50E, dip 25SW.
1315 to 1355	Fault. Hanging wall; diabase N50E, dip 10SW Footwall: broken quartzite? S50E, dip 75
1370	Short drift to east. Turn around for cars?
1370 to 1415	Diabase. S60E, dip 38S.
1415 to 1438	Light timbering. Dacite porphory.
1438 to 1456	Blocky and fractured. Not timbered. Diabase?
1456-1482	Low timbering. Dacite porphory?
1482 to 1600	Diabase. Small fault slip? at 1560.
1605	Cross cut along fault.
1600 to 1618	Fault. Klondyke fault. Quartzite breccia. E-W, dip 60N
1618 to 1656	Timbered.
1656 to 1700	Sericitized, slickensided, altered sediments. Limestone? or schist? or both.
1700 to 1730	Timbered. Dacite porphory.
1730 to 1780	Quartzite: thin beds, light grey, bright yellow deposit as coatings, seams of soft pyrite. Might be usable as marker horizon. Beds N50E, dip 20S pyrite N10E, dip 45N
1780 to 1810	Quartzite. More seams of pyrite that vary in size, strike, dip thickness, etc.
1810 to 1870	Timbered. Dacity porphory.
1870 to 1875	Incline to right, or east, to Alice #4 workings. bad caving here.
1875 to 2105	Quartzite
1925	cross cut with raise in east drift.
1995-2006	Quartzite Short drift and/or stope to east.
1925 2105	End of open part of tunnel. Caved material spilling out over top of old timber. Tracks go to here at least. Contact of Quartzite with dacite porphory at 2105. Quartzite dips 30°S. Strike E-W? or S 60 E.

(over)

PRATT TUNNEL

SAMPLE NO.	INTERVAL	WHERE CUT, ETC.
1.	31-36 feet	Measured south from breast at contact of dacite porphory with the quartzite. Channel cut, horizontally on east face in quartzite.
2.	61-66 "	As Above
3.	91-96 "	As Above.
4.	121-126 "	" "
5.	18 inches	Across contact at breast where caved.
6.	1-6 feet	As above for 1, 2, 3, & 4. A little of this could not be scaled first.
7.	6-11 "	As above for 1, 2, 3, & 4.
8.	11-16 "	" " " "
9.	16-21 "	" " " "
10.	21-26 "	" " " "
11.	26-31 "	" " " "
12.	36-41 "	" " " "
13.	41-46 "	" " " "
14.	46-51 "	" " " "
15.	51-56 "	" " " "
16.	56-61 "	" " " "
17.	66-71 "	" " " "
18.	71-76 "	" " " "
19.	76-81 "	" " " "
20.	81-86 "	" " " "
21.	86-91 "	" " " "
22.	96-100 "	" " " "
23.	100-106 "	" " except on <u>west</u> face directly opposite <u>small</u> drift.
24.	151-156 "	Measured south from Breast, in quartzite. Channel cut, horizontally on east face.
25.	176-181 "	As above. <u>181</u> feet is also the north side of the east leg of cross cut.
26.	Cut vertically. 4 feet.	In west side of the cross cut on north face, 15 feet in from the west edge of the tunnel.
27.	Cut in east drift of the cross cut,	at 40-45 feet in from the east edge of the tunnel, Horizontal cut on <u>South</u> side.
28.	200-205 Ft.	Measured south from breast. Cut in quartzite in main tunnel, horizontally on <u>east</u> face.
29.	223-228 ft.	As above for #28 except on <u>west</u> face.
30.	Grab sample.	From material caved down from hanging wall of contact at incline shaft up to Alice #4 Level.

SAMPLE NO.	INTERVAL	WHERE CUT, ETC.
31.	293. Vertical cut. ^{5 feet}	Main tunnel, east face, just south of timber, in quartzite or contact with the quartzite.
32.	313-321 ft.	South from breast. <u>8</u> foot horizontal cut on east face of tunnel across some pyrite seams in quartzite.
33.	8 foot cut	From <u>6</u> to <u>14</u> feet north from east drift at 1380 ¹⁶⁰⁰ feet into tunnel from portal. Cut horizontally on east face.
34.	5 foot cut	50 to 55 feet in, in east drift at 1380 ¹⁶⁰⁰ ft. on <u>north</u> face. Cut horizontally.
35.	Vertical cut of <u>4</u> feet.	<u>37</u> feet in, in east drift at 1380 ¹⁶⁰⁰ feet on <u>south</u> face.
36.	Cut north-south	overhead in main tunnel at 1380 ¹⁶⁰⁰ cross cut. 8 ft. channel in quartzite breccia.