



CONTACT INFORMATION  
Mining Records Curator  
Arizona Geological Survey  
416 W. Congress St., Suite 100  
Tucson, Arizona 85701  
520-770-3500  
<http://www.azgs.az.gov>  
[inquiries@azgs.az.gov](mailto:inquiries@azgs.az.gov)

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James Doyle Sell Mining Collection

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AMERICAN SMELTING AND REFINING COMPANY  
Tucson Arizona

January 23, 1970

TO: W.E. Saegart  
FROM: J.D. Sell



TROY BASIN  
PRATT-ALICE AREA  
PINAL COUNTY, ARIZONA

The western portion of the Troy Basin area was field checked on January 15, in response to a letter from Mr. J.E. Gaylor of the Universal Copper Company who has claims in the Pratt-Alice area.

The Pratt-Alice area does not appear to hold the potential that is present in the Troy Basin proper area where a weak chalcopyrite-bearing intrusive underlies altered and tactized Apache Group sediments. The intrusive dikes and sills of the Pratt-Alice area contain some quartz-sericite alteration but in general show only chloritic alteration with minor mineral showings.

Some fourteen holes have been drilled by Inspiration in the Troy Basin area ( See memo of December 13, 1967, File No. Aa-16A.0.0) and the apparent lack of follow-up from the 1966-67 drilling suggests that real encouragement for additional work was not found by Inspiration.

A traverse was made into the headwaters of Hackberry Gulch above the Pratt-Alice area to look at the O'Carroll bed - which is the most favorable replacement bed at Christmas - in the Devonian. No major alteration or mineralization was noted in the limestone, but the underlying quartzite contains heavy hematite but no diagnostic limonites.

  
James D. Sell 

JDS:ym

~~JDS~~  
read Papke

MR. ~~JDS~~ ~~WES~~

READ AND RETURN any comment?

per Note **UNIVERSAL COPPER COMPANY**

File dated 4/10/53

5613 E. MABEL

ANSWERS \_\_\_\_\_ HANDLE WES

FILE \_\_\_\_\_ INITIALS \_\_\_\_\_

DEC 17 1969

Aa 16 A. 20.20

TUCSON, ARIZONA  
W.E.S.

JAMES E. GAYLOR, PRESIDENT

re:

closed spaced DEC 17 1969

J. H. C.

PHONES: 792-0877

298-5516

Geology Department

fracts just west of Troy

DEC 2 1969

suggest you check out

to see if situation might be similar to El Arco, B.C.

Gentlemen:

RE: Sale of Copper Property

WES

Enclosed are a geology map (compiled by Dr. Willard C. Lacy of the University of Arizona at Tucson), assays, and a report on 85 claims which include my 14 claims that I am offering for sale or royalty.

The Troy Copper Co. (an eastern stock company), between 1900 and approx. 1912 had grouped 85 copper claims forming a 4-mile long oval extending NE and SW. My 14 claims are on the extreme SW end; referred to in the report as the "West Group". Inspiration Copper Co. recently spent a number of months doing geophysical work and drilling on their property north of and contiguous to my 14 claims and around the old townsite of Troy. No drilling has been done on my claims. My claims consist of the old Alice Mine workings and the 2,200-foot long Pratt Tunnel which shows on Dr. Lacy's map.

At the turn of the century this was perhaps the largest copper mining operation in Arizona. According to the old reports the richest copper ore was taken from the Alice Mine. In those early days the miners only worked the carbonate ores because they were unable to process sulphide ores. Therefore, all of the sulphide ores remain untouched. Ore that was under 7% copper was too low to mine profitably in those days. The old reports indicate that 50,000 tons of high grade carbonate ore was mined from the Alice Mine in 1902 running from 8% to 16% copper for an average of 12%. Since the Alice Mine workings (4 levels) and the Pratt Tunnel are caved-in, this property is offered simply as a raw prospect. The surface area is extremely broken and difficult to geologize. I believe that a modest amount of drilling will prove enough copper ore to justify expansion. Because the property is unproven at the moment as to whether it will or will not support a sizeable mining operation--underground or open pit--I believe it would be better for both parties to agree to an equitable royalty. The property is free and unencumbered and I will give a reasonable exploration and drilling option to any substantial company who will contract to perform the various phases of development within reasonable time limitations.

Dr. Lacy stated to me that there might be between 1,000,000 and 2,000,000 tons of "high-grade copper ore" in and near the Alice Mine. If this averaged 5% copper at current prices it would approximate \$100,000,000 worth of copper. I doubt whether any other mine in Arizona--large or small--started with a better looking base. Yet, invariably, nearly all of the big mines in Arizona have continued to expand their reserves from year to year.

In addition to such potential high-grade copper ore, the Pratt Tunnel cuts through over 200 feet of low grade copper ore. Also, for your easier evaluation, here are some quotes from the enclosed report and from the "Copper Handbooks" at the U. of A. Library pertaining to my property:

"A map compiled by the writer (Mead circa 1904) 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 (Alice workings). The ore exposed at that time was high grade and assayed from 6 to 12% copper. The Alice Shaft went down on the Alice Vein. It was 3 feet wide at the top and had widened out to 11 feet at the bottom of the shaft at 350-foot depth."

Vol. III of Copper Handbook, 1903 states, "Vein is 3' to 11' in width and gaining in width at bottom of Alice Shaft. Smelter returns for 1902 gave an average of 10% copper. 200 feet of drifting east from the Pratt Tunnel should hit the Alice Vein about 150 feet lower than the bottom of the Alice Shaft."

John C. Devine said in the old report, "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 ore body, a stoping backing of about 400 feet would result from this development." This fault was probably the south end of the Climax Fault mentioned in next paragraph.

Devine further reports with reference to the Climax Fault: "The prominent features of this fault are its strength and regularity, traceable on its surface as it is for a distance of more than 2,000 feet. Copper values are to be seen along the fault at several points where surface work has been done." I walked the length of this fault with a geologist and picked up a lump of chrysocolla copper ore from the surface that assayed 36% copper.

The 1905 Copper Handbook (Vol. V) states, "The Buckeye winze is said to show a 25-foot vein of malachite, giving smelter returns of 6 to 10% copper." My claims run right up to the edge of the Buckeye dump. The Pratt Tunnel could be extended to reach this copper ore.

These old reports and maps have proven fairly accurate as far as I have been able to tell. Any minor discrepancies appear to be personal differences by the 4 men reporting rather than any intention to deceive. John Devine (now deceased) had an outstanding reputation among mining men in his time according to my investigations. If you consider the enormous fluctuations in copper prices in those years (a drop of 31% in 1902, for example) you can understand why copper mining operations might have stopped in this relatively remote area and in later years new mines were opened in easy-to-get-to places. Today, however, the economics of mining this property are excellent. It is only 2-1/2 miles at a raise of approx. 1,000 feet from the railroad, excellent highway, and the Gila River to the adit of the Pratt Tunnel. This road could easily be built today, whereas, in the old days such road building was not even considered. This property lends itself well to block-caving, or it could be open pitted if enough copper ore were blocked out to justify it. This is the best copper ore in the world to process as it is very high in silica. The silica in places runs as high as 95%. There is a trace of gold and silver in the ore. In some places the gold should be a worthwhile by-product. Another extremely valuable factor is the fact that this copper property is within spitting distance of 7 copper smelters and only a half hour by rail to the new copper refinery that Newmont is planning to build at San Manuel (Magma Copper). This property is in the very heart of Arizona's "Copper Porkchop".

The way the faults and beds 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, nearby. After nearly 50 years, Magma at Superior is still taking out extremely high-grade copper ore from a depth of 5,000 feet. When they started down on a vein they didn't look as good as the Alice Mine looks today. Yet they have sold over a billion dollars' worth of copper.

Several firms attempted to reach the Alice bodies during World Wars I and II but gave up when they ran out of money and the copper price took a sharp drop. The Government engineers thought enough of this property to give an R.F.C. loan during World War II, but the first ore body was never reached.

This mine can be put into operation quickly and profitably. Some of the ore blocking could be done by drifting on high grade ore. There would be no need to block all the ore before starting to mine. Millions of dollars' worth of ore could go right out the Pratt Tunnel while the over-all blocking program was being carried out. Another tunnel could be driven later to the bottom of the ore simply by starting further down the mountainside, which will be closer to the Gila River, the railroad, and the highway. Ore can be removed from the side of the mountain by a stripping operation. Large tonnage may be blocked out by relatively inexpensive tunnel drilling and drifting.

Because President Johnson virtually depleted nearly all of our copper stockpile, any military emergency could put this country into an extremely critical short position on copper, despite expected production increases in the immediate future. As our population explodes, the demand for copper increases.

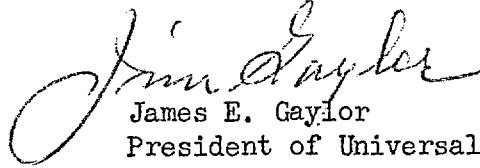
Copper ore bodies are almost impossible to find in Arizona any more. Numerous companies have had top-notch geologists and engineers working for years and spending hundreds of thousands of dollars on drilling (mostly in the most unlikely places) only to finally pack up their tents and silently steal away. They would have been miles ahead if they hadn't been so independent and had put their time and effort on a property that had such a proven copper history as the Alice Mine and surrounding claims and the Climax Fault.

Furthermore Russia is working overtime to place Communist regimes in copper-producing countries in Africa and South America, as well as building the world's largest submarine fleet to cut off American imports. In future years the United States won't be able to produce one-half as much copper as she consumes, because our mines will be petering out rapidly because of the huge tonnages of ore being milled daily. Here in Arizona some of our open pit copper mines are hauling out over 50,000 tons of ore per day, to get from 10 to 15 pounds of copper per ton of ore. As Unions force mining, milling, and smelting costs up, much of the "reserve" ore here that is marginal now will become unworkable and will remain waste rock forever. So when certain mining companies claim they have reserves for a certain number of years, they are not reckoning with over-population, inflation, and the "Unthinkable War".

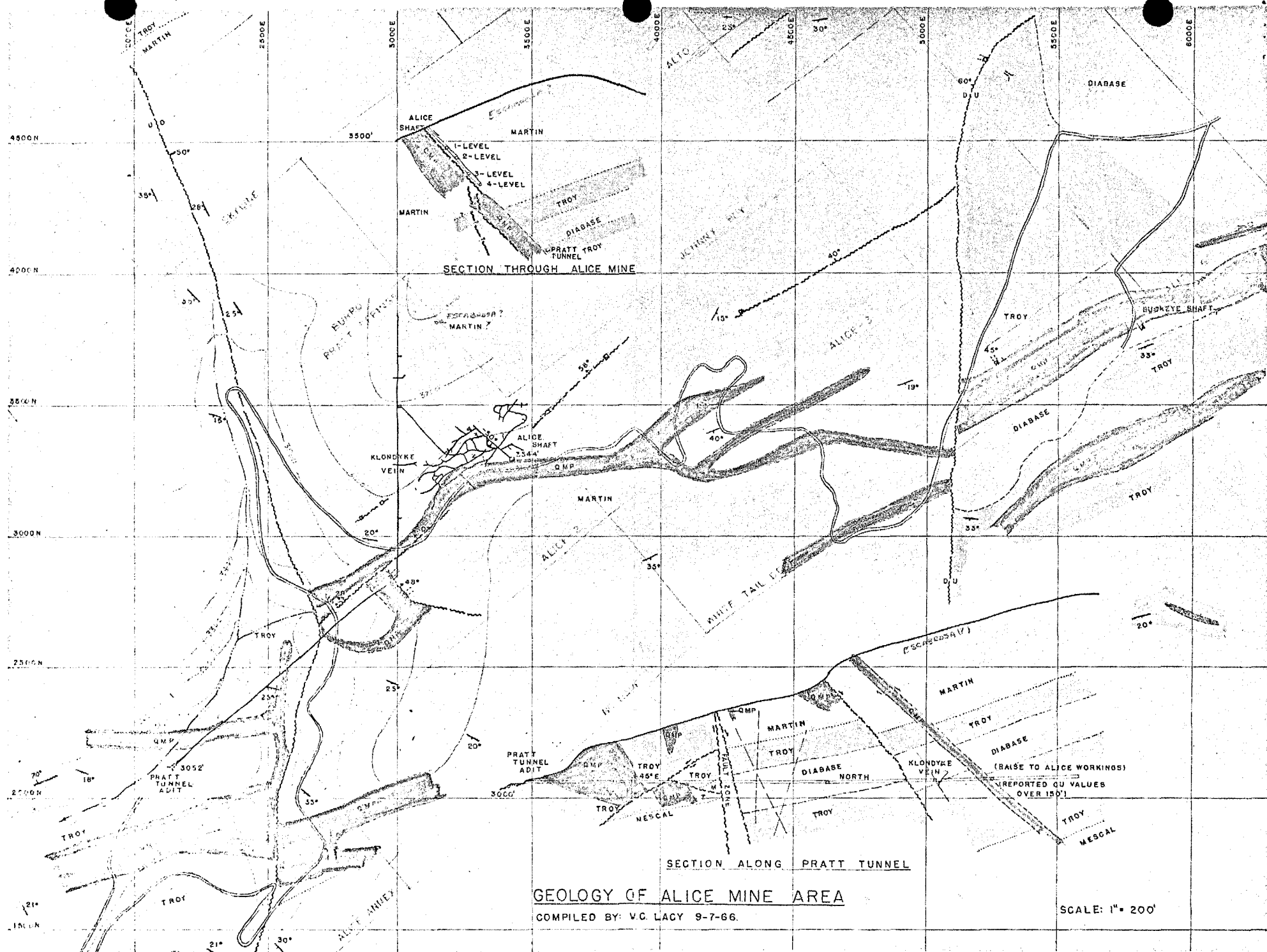
This property is perhaps the only one in Arizona where a relatively small investment might result in a billion-dollar bonanza, and where you could start producing quickly enough to cash in on the current shortage of copper and record high price.

If interested in making a copper mine or pit out of this property, please have a geologist evaluate it for you as soon as possible. I will show him the property and assist him in every way I can. I can also show him additional maps, data, etc. This proposition will remain open until all parties have made preliminary examinations and made their respective proposals. I am seeking a fair and equitable proposition from a good company. No promoters will be included.

Very sincerely yours,

A handwritten signature in cursive script, reading "James E. Gaylor". The signature is written in dark ink and is positioned above the typed name and title.

James E. Gaylor  
President of Universal Copper Co.



## 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 agency. At various times the whole area was subject to much faulting and shattering.

The porphyry dykes are from a few to fifty feet in thickness, and in some cases are much thicker. They have a general northeasterly and southwesterly strike; in the eastern portion of the property, they assume a more easterly and westerly course. The dip of most of the dykes is rather steep. The ore occurs along the fault fissures in the granite and diabase (usually along or near the porphyry dykes) 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 in 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 limestone; the other a porphyry dyke 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 dyke 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 dyke, 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 dyke, and there resulted there from the Queen vein. As the mineralization extended upward from the dyke, it follows that it became weaker the farther it got from the porphyry dyke, consequently, the richer ore bodies are to be expected near the dyke, 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 dyke. In view of the extensive body of secondary ores in the limestone, the source of which is from the porphyry dyke, there is every reason to believe that the primary ores will be very extensive and of a commercial grade.

The diabase dyke lying between the limestone and the granite is of later origin than the porphyry dyke, and no doubt was intruded after the faulting of the sedimentary rocks. This dyke has had very little mineralizing effect upon the adjacent limestone. The dyke 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 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 is more or less complex owing to extensive faulting and displacement, caused by the numerous

eruptive dykes 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 dykes cutting the granite, diabase and sedimentary beds. The ore disposition followed the intrusion of the porphyry dykes and its source is traceable to the primary mineralization which came up with the porphyry dykes.

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 places of the sedimentaries, and also followed up planes of weakness developed at angles to the bedding planes. These fissures and dikes strike generally in the northeast to southwest direction. There is one marked exception to this general rule, the Climax fault, 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 it shows stains and stringers of copper carbonate. At the point at which the shaft is located, the fault material is especially leached and koalinized; further to the north the outcrop is more siliceous.

The fissures 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 chalcocite 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 cross-cut 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. 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 formation consists of limestone, quartzite, granite, diabase, and porphyry. The latter eruptives occur in the form of intrusions, having caused minor displacements in some instances of the overlying 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 in the south slope of Climax Hill shows 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 200 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 the average as follows:

Copper 3.55%; 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 a 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 now 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 60 degrees east, and the dip about 45% 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 10%. The development work on this vein, while quite extensive work, was done for the purpose of extracting the carbonate ores, and not with the 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 consists 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 2.5%. 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 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 of the third and fourth levels. The ore exposed at that time was high grade and assayed from 6 to 12%.

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 developmental work, warrants systematic exploration, which in my opinion will lead to the development of a large copper producing 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 ore 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% to as high as 5%.

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 footwall and beneath an altered limestone hanging wall, the values below the oxidized zone consisting of finely divided particles 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 in this end of the property and probable ore that can be readily added to the reserves by following the ore on the second 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 stockpiled 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 afterward.

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 little 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 500 feet vertically. This shaft was designed to explore what is known as the Climax fault, an intrusion of porphyry 40 to 50 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 in quantity.

The prominent features of this fault are its strength and regularity, traceable on its surface as it is for a distance of more than 2000 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 100 feet, the porphyry having pitched sharply to the west. At the 500 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 indicated would be about \$20,000.00 and the work could be accomplished in 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, will be the inevitable result of intelligent development through the Pratt tunnel on the west end.

The Pratt tunnel which was driven a distance of about 2000 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 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 Klondike vein measuring four feet in width and averaging about 2% copper. Very little work was done on this vein due to the low tenor of the ore which was not considered at that time 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 at 400 feet east of the Klondike 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 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 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 seven 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 been heretofore not considered commercial, due to inadequate transportation facilities."

#### CONCLUSIONS:

##### LEO VON ROSENBERG:

"It is reasonable to expect that with 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 premise 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.

I will not go into details, but I will 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% 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 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 shattering 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 old workings."

CONCLUSIONS:

JOHN C. DEVINE:

"In conclusion it is to be noted that with the expenditure of an amount somewhat less than \$100,000.00 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% 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% on a very large scale of operation."

MAY 11 1967

T. J. WOODSIDE ✓  
L. C. TRAVIS  
W. R. KELLY

UNIVERSAL COPPER CORPORATION

2308 E. 17TH STREET

TUCSON, ARIZONA

20 S. SCOTT

JAMES E. GAYLOR, PRESIDENT

April 10, 1967

PHONES: MAIN-4-3288  
MAIN-2-3512

792-0877  
298-5516

Mr. R. D. Bradford, President  
American Smelting & Refining Co.

Dear Mr. Bradford,

For years I have been holding the old Alice Mine-Pratt Tunnel copper property (14 claims) which was a part of the Troy Group (85 claims)--which was one of the largest copper mining operations in Arizona in 1902.

Recently one of the world's top geologists estimated approximately 2,000,000 tons of high grade copper ore on my claims--5% and up. There is approximately 200 feet of low-grade copper ore showing in the Pratt Tunnel. The high-grade ore is between the tunnel and the Martin limestone cap above. In the tunnel I knocked off a sample that assayed 22% copper. On the surface above I picked up a lump of chrysacolla that assayed 36% copper. There is some gold and silver. There is a very high silica content--in places assaying 96%.

The economic factors are ideal for a big profit on a small investment. The property is only 2-1/2 miles (as the crow flies) from the highway and railroad down at the Gila River--gentle slope most of the way.

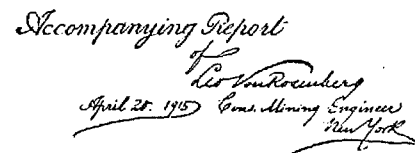
This property has never been drilled--therefore it is impossible to set a price on an unexplored property, but if your company is willing to drill and mine the property (if warranted), I will be contented with a fair and equitable royalty. I am in a position to give your company any reasonable option that you might ask for.

I'm sure you know that Inspiration Consolidated Copper Co. has picked up all the old Troy claims contiguous to this property on the north--have done extensive geophysical work and drilling on it. In my humble opinion the 14 claims under my control are better than all the other 71 Troy claims put together which Inspiration now are holding.

So if you are interested I would be happy to present all of my material on the claims to your Chief Geologist and to show him the property at his convenience.

Very sincerely yours,

*Jim Gaylor*  
James E. Gaylor



AMERICAN SMELTING AND REFINING COMPANY  
Tucson Arizona

July 31, 1958

T A. S.  
JUL 31 1958

Mr. L. H. West  
Chief Geologist  
New York Office

A. C. H.  
AUG 1 1958

PRATT ADIT  
Troy-Arizona Group  
Troy District  
Pinal County, Arizona

Dear Sir:

Enclosed is a not  
fact property. This dist  
because it contains some  
We have looked it over be  
there in the near future.

FROM: J. D. SELL

2/8/88

TO: Neil Gamble  
Ray Mines Division

Mr. Blucher check  
being owned for some 50 y  
2300 feet had just been in  
by this new work does not  
will keep in touch, and if  
opened we will have a lead

Thanks for the copy to Goldfarb  
on the Alice Mine.

As noted in the file memo,  
ASARCO did sample the "1500"  
mineralization back in 1958

You are right — need  
new drill hole/assay info  
to be of interest.

Enclosure  
JDS/bs  
cc: ASB/bs

Jim

ASARCO Incorporated

FEB 8 1988

SW Exploration

FILE

Alice Mine

Toy Bennett Mine, AZ

~~Gold Co. AZ~~

Penal Co., AZ

February 4, 1988

Mr. James E. Gaylor  
Gaylor Enterprises  
6742-D Calle La Paz  
Tucson, AZ 85715

Dear Mr. Gaylor:

Thank you for your letter of January 13, soliciting our interest in your Alice Mine area claims. A review of our files shows that we, as Kennecott's Ray Mines Division and Bear Creek Mining Company, have evaluated your property on three separate occasions in the past. As the Ray Mine now belongs to ASARCO, we know their exploration group has also looked at your claims. On each occasion, no further interest was warranted.

Accordingly, it is our consensus that further interest in the Alice Mine would have to be based on new information that you may have acquired since our prior investigation. If you are able to supply additional data, we would be happy to review it.

Yours sincerely,

ORIGINAL SIGNED BY  
R. W. BANGHART

R. W. Banghart

RWB/EAG/bm

cc: J. D. Sells ✓  
N. A. Gambell  
E. John

12/88/180

C  
O  
P  
Y

AMERICAN SMELTING AND REFINING COMPANY  
Tucson Arizona

July 31, 1958

T A. S.  
JUL 31 1958

Mr. L. H. East  
Chief Geologist  
New York Office

A. C. H.  
AUG 1 1958

FRATT ADIT  
Troy-Arizona Group  
Troy District  
Pinal County, Arizona

Dear Sir:

Enclosed is a memorandum by Mr. Blucher on the subject property. This district is of some interest to us because it contains some porphyry copper mineralization. We have looked it over briefly but expect to do more work there in the near future.

Mr. Blucher checked on this Pratt Adit because, after being caved for some 50 years, about 1500 feet of a total of 2300 feet had just been reopened. The mineralization reached by this new work does not amount to anything. However, we will keep in touch, and if the remainder of the adit is reopened we will have a look at it.

Yours very truly,

Original Signed By  
K. Richard

KENNETH RICHARD

Enclosure  
KY/ds  
cc: ASBBlucher

AMERICAN SMELTING AND REFINING COMPANY  
Tucson Arizona

June 2, 1958

T A S

JUL 31 1958

K. R.

JUL 29 1958

FILE MEMORANDUM:PRATT ADITTroy-Arizona Group  
Troy District  
Pinal County, Arizona

On April 23rd. R. L. Brown and I visited the Pratt adit and Alice Mine to investigate the copper mineralization reportedly reached during the reopening of the Pratt adit by James E. Gaylor of Tucson, Arizona. This property is the western-most working of the Troy-Arizona Group and was first examined for this company by A. H. Means in December of 1915. It is situated on the southwest flank of the Dripping Springs Range about 5 miles NE of Kelvin, Arizona, but can be reached at present only from the Dripping Springs Valley road on the northeast of the range.

Geologically this area must be considered favorable for copper mineralization. Quartzites and limestones have been intruded by thick diabase sills, by a granitic Laramide intrusive, and by later porphyritic dikes. Copper mineralization along the dikes and along numerous small E-W striking faults is common. Small areas of alteration have been observed within the stock.

The Alice workings consist of an inclined shaft and crosscuts on a narrow vein in limestone along the hanging wall of an andesite porphyry dike. All are inaccessible and have been so for about fifty years.

The Pratt adit was driven in 1904 to intersect the Alice workings at a depth of about 500 feet below the shaft collar. It is reported to have a total length of about 2300 feet but has been closed by caved ground most of the time since the original opening. Old reports mention copper mineralization in brecciated quartzite at 1500 feet (50 ft. of 2 1/2% Cu) and at about 1900 feet (260 ft. of "low grade disseminated copper sulfides").

On the basis of these reports Gaylor has reopened the tunnel to about 1500 feet and encountered what must be presumed to be the first zone of mineralization. This proved to be much less than 50 feet in width, the better mineralization being about 15 feet in width. Two samples were taken which assayed 0.51% Cu and 0.33% Cu. The values occur as chalcopyrite and chalcocite both disseminated and as small vugs and veinlets, and occasional chrysacolla.

The mineralization as exposed in the presently opened part of the tunnel is of no interest; however, in the event there is further work and the tunnel is opened to the second reported zone of mineralization it should be examined. The district as a whole will be studied during the regional reconnaissance mapping of the Ray-Christmas Area.

Att: Sketch Map

  
A. G. Blucher



# Pratt Tunnel & Alice Mine

Plan from maps by:

R.G. Mead &  
L. Von Rosenberg

Geology by:

A.G.B.  
R.L.B.

1" = 250'



Limestone.



Quartzite.



Andesite.



Diabase.

Old reports (1904) say 260' of  
brecciated quartzite with weak  
Cu sulphides.

Inclined Raise

ALICE SHAFT  
400 ft. (-) 45°

18" vein in ls. along hanging wall  
of andesite phy dike - mostly  
limonite - no sample.

ALICE  
SHAFT

Brecciated zone in quartzite  
along fault contact with  
diabase - pyrite, chalcopyrite,  
chalcocite, Cu oxides.

PRATT TUNNEL

PRATT TUNNEL

NORTH-SOUTH SECTION (A-A')

Looking west.

## Sample No. 1

10' vertical cut  
across bedding.  
Total: Cu 0.51%  
Ox 0.11%

## Sample No. 2

15' horizontal cut  
across breccia.  
Total: Cu 0.33%  
Ox 0.08%

NOTE:

Shaded workings are  
caved or inaccessible.





## NOTE FILE ON "PORPHYRY COPPER"

Location: *Pinal* Gila County, ArizonaL. K. 177,  
APR 17 1953Property  
District Troy  
See Index Map (p. ....) Mt. Range Dripping Spring

## Source of Information

- ☐ Field Observations  
☐ Publications  
☐ Company Files  
☐ Other

## Explanation:

Field check on April 8, 1953. Area spotted as possible alteration zone by J.H.C. and K.P. recon. flight 3/12/53.

Date April 8, 1953

## Recommended Company Interest Classification:

- ☐ Active  
☐ Possible  
☒ None  
☐ Scientific

## Qualifying Remarks:

Area shows some resemblance to porphyry copper deposit, but lacks extensive alteration or evidence of much copper mineralization.

(see p.....)

## MINERALIZATION (See Sketch Map ....)

## Alteration and Metallization:

Some mineralization observed just west of old, vanished settlement of Troy. Mineralization confined to east-west and northeast trending fissures. These fissures are generally spaced 3 to 4 inches apart. Pyrite was the principal sulphide but some boxworks after chalcopyrite and a small amount of limonite after chalcocite testify to the former presence of some copper. Serpentinization and some silicification are present along fissures but the intervening igneous rock is almost fresh.

## Leached Outcrops:

Limonite after pyrite, minor amounts of "live" limonite and chalcopyrite boxwork. Insignificant amount of secondary copper mineralization in the moderately reactive rock is probably due to the high ratio of pyrite to copper sulphides.

(see p.....)

## Enrichment:

See above.

(see p.....)

## Associated Metal Deposits:

Minor magnetite-pyrite-chalcopyrite deposits along contact of igneous rock with limestones and quartzite.

(see p.....)

## STRUCTURE (See Sketch Map p. ....)

## Fissures:

Fissures trend northeast and east-west.

(see p.....)

## Intrusives:

Intrusive in Troy Basin is classified by Ransome as a granodiorite. Numerous north-east and east-west striking dikes are present in area.

(see p.....)

## Breccia Pipes:

(see p.....)

## Cover Rocks:

No cover rock in immediate vicinity.

(see p.....)

## DEVELOPMENT, PRODUCTION, FACILITIES, ECONOMIC POSITION, ETC.:

See U.S.G.S. Folio 217(Troy) for map of area by F. L. Ransome.

(see p.....)

cc:WEL(2),SAS-LKV-JHC-KCP

Date April 10, 1953 By K. G. Papke

ALTERATION & METALLIZATION(Cont'd):

At one point a shaft was sunk on outcrop showing some secondary copper minerals. Samples from dump contain quartz-pyrite-chalcopyrite with so minor chalcocite. Judging from the size of the dump, the shaft was probably less than 75 feet deep. A nearby shaft is filled with water to a point about 50 feet from the collar. On the dump is completely fresh igneous rock.

K. G. Papke

REPORT ON THE  
TROY-ARIZONA COPPER COMPANY  
KELVIN, ARIZ.

BY

A. H. MEANS.

Silverbell, Ariz. Jan'y 8th, '16.

Mr. J. Kruttschnitt,  
American Smelting & Refining Co.,  
Tucson, Ariz.

Dear sir:--

I herewith transmit report on the Troy Arizona  
Copper Company, Kelvin, Ariz., made in accordance with in -  
structions .

Yours very truly ,

*A. H. Means*

## SUMMARY.

LOCATION. The camp of Troy lies 7 miles by wagon road north east of Kelvin, Arizona.

EXTENT. The property comprises 87 claims, three of which are patented. The claims extend north east and south west. The property is twelve claims long by two to thirteen wide.

GEOLOGY. A thick series of quartzites and limestones has been intruded by biotite granite. Following this there came an intrusion of andesite porphyry. This was followed by a sill-like dike, of diabase, very nearly but not quite conformable with the bedding. Lastly a considerable number of aplite dikes came in. The region is considerably faulted by faults of relative small magnitude.

MINERALIZATION. In the language of the prospector the property would be called an iron blow-out. Horizons in the sediments have been heavily impregnated with limonite and hematite. The limestone in contact with the andesite has been rendered ferruginous for a thickness of 20 to 30 feet. The ore horizons are in the diabase, in the ferruginous quartzite and in the iron limestone.

OREBODIES. These could not be gotten into because of the caved condition of the ground. All data on the ore deposits is hear-say.

CONDITION OF THE MINES, EQUIPMENT, ETC. The mines have been idle 12 years, were poorly laid out in the first place, and are in dangerous shape at the present time. In the event of opening up the property little if any of the old work could be used. The old workings are said to comprise 30,000 feet of work, about 1/10 of this amount can now be visited. The property is practically without mine equipment. The living quarters are very well built and are in excellent repair. When running the mines employed about 80 white men.

In 1907 a man by the name of Chapin made a shipment of ore from the Rattler mine to Humbolt.

HAYDEN-TROY ROAD. On the Troy end the road is in bad shape and has steep grades. It lies in a canyon bottom and is not infrequently taken out by freshets. A new road would have to be built around this bad part (about 4 miles). The remainder of the road is in fair shape.

CONCLUSIONS. The property in its present state is practically undeveloped. Mining costs would be high in all probability, as the ground is bad and water rather abundant.

Geologically the property looks as if some ore might be developed.

Recommendations concerning the property are at the end of this report.

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Not a map

See map

See map

## INTRODUCTION.

SCOPE OF REPORT. Examination of the property of The Troy-Arizona Copper Co., with a view toward determining the present extent and condition of the property , its accessibility and the amount of ore actually developed and also the prospects for the development of further ore.

LOCATION. The camp of Troy lies , in an air line , 5 miles ( 7 miles by wagon road) northeast of Kelvin , Arizona. As is seen by the map ( U.S.G.S. Ray Quadrangle) Troy is seen to lie on the divide of Mescal Mountains , known locally as the Gila Range. The Globe-Kelvin stage road passes thru the camp.

TOPOGRAPHY. The camp lies in a high pleateau -like flat , altitude 3644 feet, on the divide where the Globe-Kelvin stage road crosses the Gila Range. North west of the camp is a high quartzite ridge whose highest point is Troy Mt. Altitude 4970 feet. South and South east of the camp the range continues but at a lower altitude . To the north east and east the country goes down gradually on a rough broken slope to the Dripping Springs Valley.

EXTENT. The property comprises 37 claims , three of which are patented. The claims ( see map) extend north east and south west . The property is twelve claims long by two to thirteen wide.

CLIMATE. The summer climate consists of warm to very hot days, with as a rule cool nights.

The winters are relatively cold with considerable precipitation both as rain and snow, the former being more

abundant. The winters are sufficiently cold to make it impossible to lay uncovered water pipes on the ground. Three feet of snow has been recorded and heavy frosts and cold snaps, which make ice are not infrequent.

#### GEOLOGY.

The areal geology is shown on the accompanying map.

SEDIMENTS. The Gila Range is composed of a series of quartzites and some limestone. The total thickness of sediments is about 2000 - 2700 feet, limestone 500-1000 feet and quartzite 1500 - 1700 feet.

The quartzite contains many horizons which vary all the way from a pure white quartzite with silicious cement to a quartzite which has been so heavily impregnated with limonite and hematite that little of its original composition remains. In places the quartzite is decidedly conglomeratic, containing quartzite pebbles up to 1.5 inches in diameter. The pebbles are quite angular which is probably due to dynamic action after the quartzite had been formed followed by recementing of the broken material. Some horizons of the quartzite are decidedly calcareous and resemble a siliceous limestone. These latter, probably not over 300-400 feet in all, aggregate a much less thickness than do the true quartzites.

THE LIMESTONE. In this connection, the limestone 150-200 feet thick or less, on the eastern edge of the map is not discussed as it is a considerable distance outside of the property. The limestone here mentioned is located on the western slope of the Gila Range and is from 500-1000 feet in thickness.



It is a hard bluish limestone which in places has been recrystallized. Tiny veinlets of secondary calcite are occasionally seen. The limestone contains considerable quantities of fossils, which appear to be Devonian(?) , or at any rate early Paleozoic. In one or two places this limestone is underlain by andesite porphyry , the former being hematized at the contact. The limestone is normally both over and underlain by quartzites.

IGNEOUS ROCKS. The igneous geology of the region is somewhat complicated. After the sediments were in approximately their present position , they were intruded by a relatively small body of biotite granite. This rock is for the most part of medium texture , quartz fairly abundant, orthoclase feldspar occurring in white indistinct grains and biotite present in small hexagonal masses.

The sediments and one corner of the granite area have been intruded by a sill-like dike of diabase . The diabase has the same dip and practically the same strike as the sediments , cutting across them at a very slight angle. This intrusion is about 150-200 feet thick and varies somewhat from place to place in composition . It is a dark fine grained black-green rock composed essentially of hornblende, with probably some pyroxene, and plagioclase feldspar which appears in small interlocking tabular crystals. The rock is probably a basic diorite or gabbro, which one of these it is could not be determined without a petrographic examination. It is a carrier of copper values to some extent as one stop in the

diabase was seen in the Rattler Tunnel (more stopes , some containing ore , are said to be in the diabase in this mine.)

Another phase of the igneous activity was the intrusion of andesite porphyry, which occurs both as an irregular porphyry belt and as dikes. This andesite has a dense green ground mass containing medium small tabular phenocrysts of plagioclase feldspars. Basic segregations in the granite are composed of this andesite . It is reasonable to assume , & therefore , that the andesite was derived from the granite by magmatic differentiation . In the western portion of the area this porphyry underlies the limestone in some places, the limestone being altered to limonite and hematite to a distance of twenty or thirty feet from the contact.

The last phase of the igneous activity was the intrusion of a considerable number of aplite dikes. These vary in width from mere stringers to 2-3 feet, and , are light in color and dense in texture . The prevailing strike appears to be N.30 Degrees E. (true) , with vertical dip, but all sorts of directions were noted , the dikelets apparently following joints in many cases .

All the igneous rocks above described , the granite excepted , are thought to be derivatives through magmatic differentiation of the biotite granite . The andesite was the first derivative , the diabase the second and the aplite the last . This sequence is what the field relations seem to bear out , which corresponds in a general way to general geologic conceptions of cooling magmas , which are of no interest

FAULTING. The district has been considerably faulted as is shown in sketches of underground workings accompanying this report. No faults of great magnitude were seen in the district, the movement being confined for the most part to a warping of the sediments with numerous faults of small magnitude. This warping is shown by the limestone, which is underlain by andesite porphyry. The strike of the limestone is here in the neighborhood of N.60 Degrees E. as against N.80 Degrees W., the prevailing strike of the sediments. Old miners in the district state that the ore bodies are often dislocated by faults of small magnitude. To the south of Troy on the Kelvin road in the vicinity of Kane Springs there appears to have been a fault of somewhat greater magnitude, as the diabase is elevated into view, where normally it should be a considerable distance under ground.

On the Buckeye-Alice road to the west and south west of the camp the abrupt termination of the limestone appears to be due to warping rather than to faulting, the limestone having been removed by erosion from the up-warped areas.

MINERALIZATION. In the language of the prospector, the property would be called an "Iron blow-out". The mineralization has consisted in a strong and widespread impregnation of horizons of the sediments by hematite and limonite and to a much less extent secondary silica. In general where igneous rocks come in contact with the sediments, the latter are metamorphosed into a heavy compact mass of essentially hematite and limonite (perhaps some magnetite) to a distance

of from 1 to 2 to 20 to 30 feet from the contact .

Along the road to the Buckeye and Alice mines considerable porphyry ( see map ) underlies the limestone . Along the contact the limestone is greatly altered as above described.

On the south eastern and eastern side of the Gila Range the quartzite along the contact with the diabase is highly altered in the same manner.

In the stope on the incline of the Rattler tunnel ( see map ) pyrite , chalcopryite and bornite were seen in the diabase. In this place the diabase has a peculiar banded appearance , the bands consisting of secondary silica extending parallel to the bedding .

As far as was seen none of the other igneous rocks in the district showed any signs of mineralization .

ORE BODIES. Of these nothing can be said except on hearsay data as the only ore seen in place was in the incline of the Rattler tunnel . As is seen by the map this is small in amount as it is cut off on the east by a fault . This ore has already been described under mineralization .

A few pieces of ore were picked up at the old smelter below the Buckeye mine . These appeared to have been limestone originally , , but had been very strongly impregnated with specular hematite . The copper minerals consisted of bornite a little oxidized copper and a very little chalcopryite. Some black iron (psilomelene) may also be present . This ore (there were only one or two small specimens found ) presumably came from the Buckeye Mine.

examining the property told him that on the three hundred foot level of the Rattler mine (Sisson Shaft) there were 33,000 tons of 5% copper ore blocked out along a vein of sulphide copper ore MINES.

The principal mines of the camp , whose location can be determined from the claim map , are , The Buckeye ; Manhattan (Rattler) ; Ratter (Sisson Shaft) ; '91 ; Alice and Alice Tunnel ( Dime Claim ) . Besides these are many prospect holes and small workings.

TOTAL WORKINGS. Mr. Leo Van Rosenberg , Engineer for the property , made the statement that the old maps showed in all 30,000 feet of workings . Roughly one tenth (1/10 ) of that amount can now be visited , including all workings on the property.

BUCKEYE MINE. As far as can be learned this was the largest mine in the group . The shaft is two compartment , one skip-way and one man - way , sunk in the porphyry and is said to be 500 feet deep . At present the shaft is full of water to within 150 feet of the collar. The workings of this mine are said to be extensive , 1000 to 2000 feet of drifts or more. This , in a general way , is borne out by the dump , which is of fair size , even tho a portion of it has been removed by the creek. A sketch of as much of the mine workings as could be gotten into accompanies this report. .

On the hill side a few feet below the Buckeye shaft is a little old smelter , which was operated a considerable number of years ago.

An itemized list of mine and smelter equipment is given below.

MINE EQUIPMENT.

HEAD FRAME . Double mine wooden head frame thirty feet high , old but in fair shape .

One Bakers' No.4 Rotary pressure blower. Appears to be in good shape .

One small ( 5 - 10 H.P. ?) Atlas single steam engine to run blower. Also rigged at one time for 14" circular saw.

BOILERS. Three Atlas Eng. Works , Indianapolis , Ind . fire tube boilers. 58 2 $\frac{3}{4}$ " X 9' tubes per boiler--- Poor shape.

HOIST. Has Been removed.

COMPRESSOR. Small 2 stage Leyner 12"X14"X15"X14" in goodshape.

DYNAMO. Triumph Electric Co., 30 Amp. 250 Volt 1350 R.P.M. . Appears to be alright . One small switch board.

One small 2 - 3 H.P. single cylinder Fairbanks Morse gasoline engine (vertical) .

Compressed air storage tank 4' X 8'

One **S**now steam pump . 6"X4"X8" .Fair(?) . shape. Piston rods missing .

The four buildings on the property are mere sheds and are ready to fall down .

### SMELTER EQUIPMENT .

BREAKER. 10"X 7" Blake . Good shape.

One small single cylinder Atlas steam engine to run crusher.  
Six bins for flux, fuel and ore. Bins ready to fall down, the most of the lumber is good. Capacity of the six would be about 1000 tons ore.

Blast Furnace. Shaft Type. Six  $3\frac{1}{2}$ " tuyeres. 8' from bottom of crucible to feed floor. Diameter of crucible 3.0' Diameter shaft at feed floor  $4\frac{1}{2}$ ' .

Blower No. 4. Roots. In good shape . No engine for blower.  
Slag Pots . Five small ones.

Slag Dump. Contains about 3000 cu.ft. Part of the dump has been removed by the creek. Smelter was very little used judging by the dump.

ALICE MINE. This consists of an incline shaft going down 45 degrees in a north 45 degrees W. (true) direction along the contact of the limestone and porphyry , the bottom of the incline being in porphyry. This incline is supposed to be 350-400 feet deep, which checks with the dump. One hundred feet down where the incline wholly enters the porphyry , the ground is so badly caved as to stop further examination .

It is of interest to note that the spreaders for the mine rails have been broken and bent upward by the swelling action of the porphyry. There is no equipment whatever at the mine.

ALICE TUNNEL ( DIME CLAIM.) This tunnel was started to hit the bottom of the Alice incline shaft described above .

Thru a mistake the tunnel was headed for a line projected

was necessary to hit the bottom of the shaft . It is stated that this tunnel contains a considerable amount of sulphide copper ore. No ore was seen in the length , 880 feet , that could be examined. Water runs continuously from the tunnel at the rate of 8 to 12 gallons per minute. A sketch of the tunnel accompanies this report. There is no mine equipment except track and a couple of mine cars on the property.

THE '9L This mine is situated on the first ridge which is crossed by the Buckeye - Alice road west of the camp. It is reported to have considerable workings , 400 foot shaft and etc., but during the twelve years the property has lain idle evrything has caved so badly as to make examination impossible .

MANHATTAN ( RATTLER ) This mine lies at the extreme eastern edge of the camp and consists of two tunnels , the upper connecting with the Sisson shaft , while the lower in the main entry . A sketch showing as much of the workings as could be visited thru this tunnel , together with a few assays accompanies this report.

The workings are in the diabase , with the exception of one shear zone where quartzite and diabase appear to be intimately associated . On the incline drift at the end of the tunnel is a small stope , where two copper assays of 3.12% and 1.37% respectively were obtained over a vertical width of about four feet. In a eight foot hole near the face of the incline a copper assay of 2.80 % was obtained . These three assays are in the diabase . The ore minerals being principally chalcopyrite with small amounts of pyrite , bornite



and oxidized copper. A grab sample from the old ore bin at the mine 4.78% copper. This ore was very ferruginous , some pieces , as far as was apparent to the eye , being composed entirely of oxides of iron . There is no equipment save an old shed at the mine .

RATTLER ( Sisson Shaft) This is on the same claim as the mine just described and normally connects with it , the connections now being caved. Sketch of those workings that could be visited accompanies this report. Two samples of ferruginous quartzite were taken which ran 0.47 and 0.30 % copper respectively . The shaft is in fairly good shape and the caved solid 145 feet from the collar , most of this caving seems to be from upper portions of the shaft . The shaft is supposed to be about 400 feet deep and to have produced some good ore . In 1907 a man by the name of Chapin is said to have made several shipments to Humbolt.

#### WATER .

All the mines contain more or less water , some tunnels well above the camp give a small trickle at all times. The water seems to be principally surface water. Much of the igneous rock in the district is decomposed and makes a fair sponge . In mining , water has been a considerable problem at this camp.

#### HAYDEN - TROY WAGON ROAD.

The condition of this road on the Troy end is bad . For a distance of about 4 miles the road follows the bottom of Kane Springs Canyon , crossing and re-crossing the creek ,

normally dry , *many* times and for short distances lying wholly in the creek bed . The road is covered with boulders of assorted sizes , especially in the creek bottom . About three times a year, occasionally oftener , the road is washed out by freshets. In the four miles above mentioned , the road drops 1600 feet or 400 feet to the mile (slope 1 to 13.2) . In the first two miles from Troy the fall is 900 feet. The road is narrow , contains steep pitches and sharp turns.

This road is the Globe - Kelvin stage road , the stage being a 55 H.P. Velie truck (1500 pounds carrying capacity) This machine appears to get over the road without difficulty. Cars of less power are frequently stalled and are unable to get over the divide . In the road's present state heavy motor haulage would be impossible , or at the best, very difficult. The solution would be to build a new road , about four miles , out of the creek bottom down to the Hayden - Kelvin road. This latter , altho it was not gone over personally , is all right as motor cars of all types travel over it .

An alternative would be to continue the Buckeye-Alice road down to the Gila River. This road while not so rough and rocky at present would have many sharp turns and be as steep as the old road. At present this road goes as far as the Alice tunnel and is well built and wide.

By the present road the distance to Hayden is 13 miles.

### CONCLUSIONS.

Most of the old work could not be used in the event of the mines being opened up .

Mining costs ( upon which no data was obtainable ) would probably be high .

In workings at any depth , about 200-300 feet or more , water would be a considerable item.

The property is practically in an undeveloped state . All the old workings where the ore is supposed to be in any amount are inaccessible . Any new company taking over the property would have to develop their ore as there is practically none "in sight".

During the twelve years that the property has been idle the company has been unable or unwilling to do anything other than the requisite assesment work to hold the property . This has developed no ore .

Considering the property geologically <sup>n</sup> conditions seem favorable for the occurrence of ore bodies , both in and near the diabase and as contact metamorphic or replacement deposits in the limestone . The mineralization , as described elsewhere, is strong and wide spread.

There is practically no equipment on the property .

Mr. Leo Von Rosenberg , engineer for the company , made the statement that he was unable to get any information of value from the maps and data at the company's New York office.

RECOMMENDATIONS.

In view of the lack of precise data it is difficult to make any definite recommendations . If however the company wishes to prove the existence or non-existence of ore in the property it would be well to :

First: Clean out the Sisson shaft , it does not appear to be badly caved , and try to get into the <sup>lower</sup> workings of the Rattler Mine and see what can be found there.

Second: Clean out the cave in the Alice tunnel and get back into the limestone (judging from surface tunnel should enter the limestone ) . The tunnel is supposed to be 2200 feet long, and if there is any chance for ore in the limestone it should shed considerable light on the matter.

Third: Find the extent and grade of the ore shipments made by Mr. Chapin to Humbolt in 1907, from the Rattler mine.

*A. H. Means.*

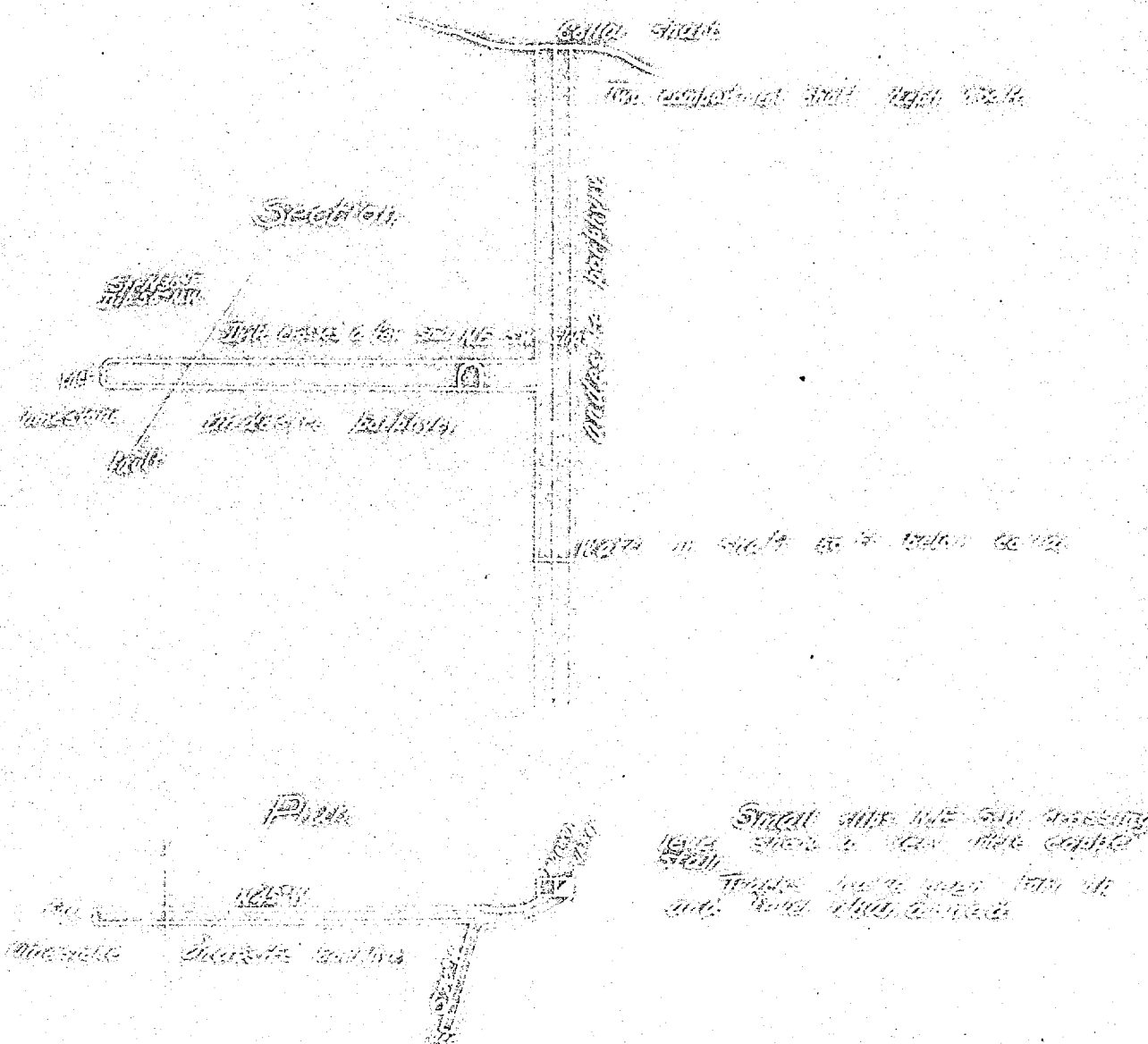
Silverbell, Arizona .

January 2nd., 1916 .

MAPS.

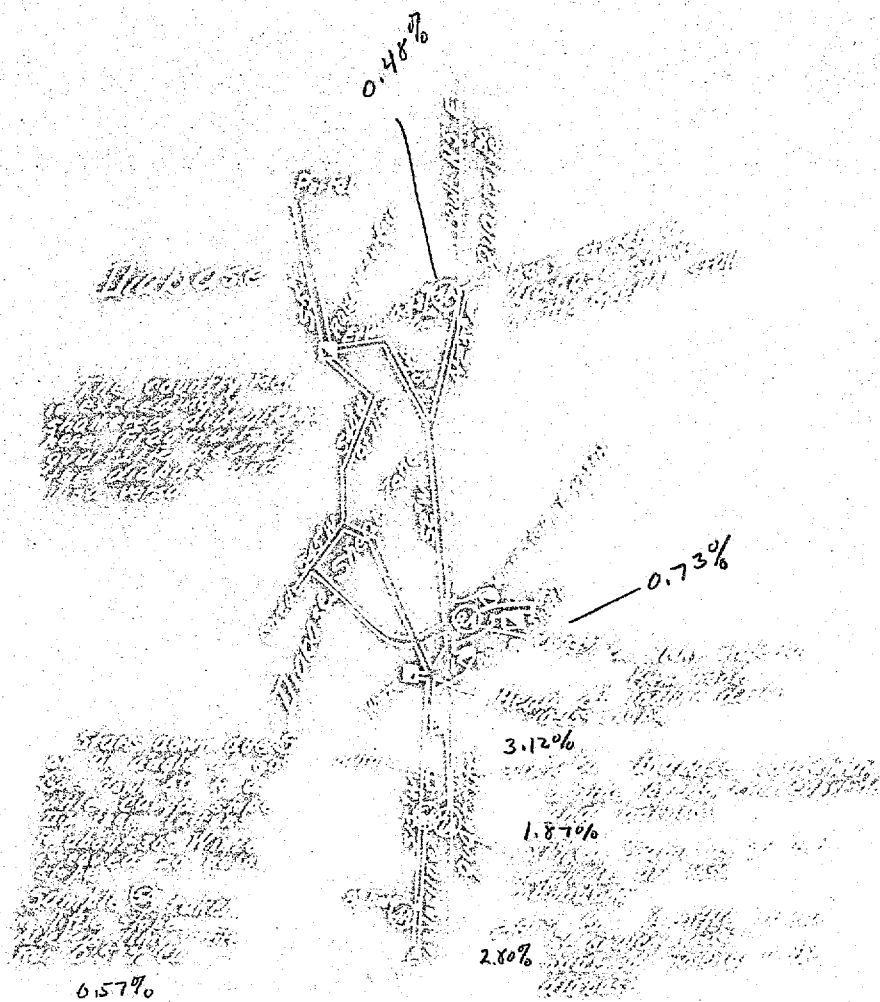
On the following maps all measurements are by pacing ,  
and all angles and bearings are taken with a Brunton compass.

Score 100 = 60%





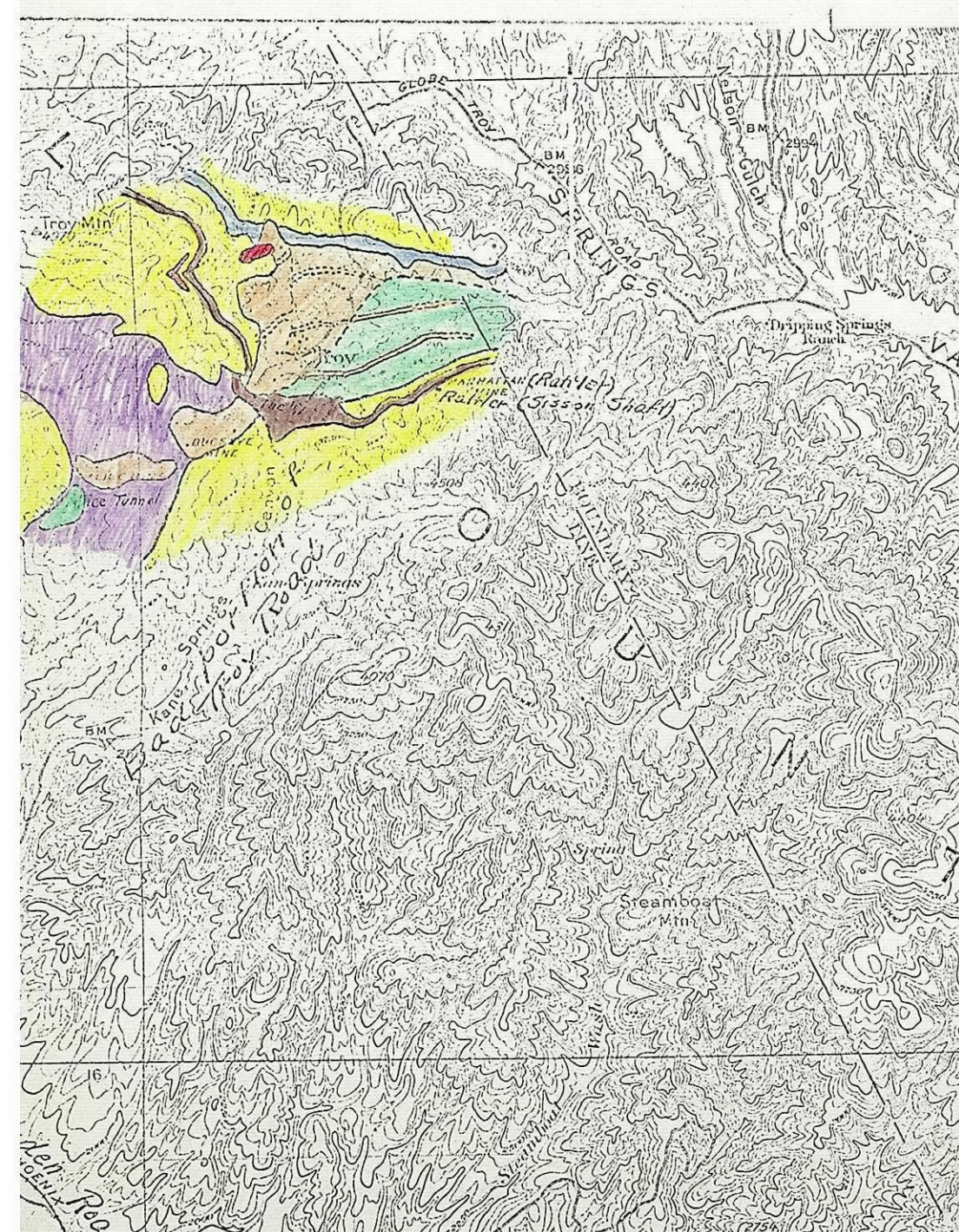
Wray, Arizona Copper Co.  
Bureau of Mines  
Scale in = 100 ft.











## Legend.

**Quartzite.** Varies in composition from a pure white quartzite with siliceous cement to a heavy compact mass composed of hematite and limonite.

This quartzite both over and underlies the limestone. The various horizons were not differentiated.

**Limestone.** Bluish and of medium texture in places recrystallized. Contains fossils of Devonian (?) age.

**Biotite Granite.** Medium grained, quartz fairly abundant, orthoclase feldspar in white indistinct grains, biotite in small hexagonal masses. Grades into andesite and contains basic segregations of andesite.

**Andesite.** Dense greenish groundmass containing small tabular phenocrysts of plagioclase feldspar. Contact with granite indistinct grading into the latter.

**Diabase.** A finely crystalline greenish rock. Plagioclase occurs in small interlocking tabular crystals.

**Porphyritic Granite.** Coarse grained, quartz fairly abundant, large pinkish orthoclase feldspar crystals and small greenish masses of hornblende.


**Diorite.** Medium grained. No quartz visible. Plagioclase in small roughly tabular crystals. No Devonian minerals appear to be present.


**Limestone.** This is a fine grained bluish limestone lying on the northern edge of the area. It is about 1500 feet thick on the average.








# Legend


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
Quartzite. Varies in composition from a pure white quartzite with siliceous cement to a heavy compact mass composed of hematite and limonite. This quartzite both over and underlies the limestone. The various horizons were not differentiated.
- 


Limestone. Bluish and of medium texture, in places recrystallized. Contains fossils of Devonian (?) age.
- 

Biotite Granite. Medium grained, quartz fairly abundant, orthoclase feldspar in white indistinct grains, biotite in small hexagonal masses. Grades into andesite and contains basic segregations of andesite.
- 

Andesite. Dense greenish groundmass containing small tabular phenocrysts of plagioclase feldspar. Contact with granite indistinct grading into the latter.
- 

Diabase. A finely crystalline greenish rock. Plagioclase occurs in small interlocking tabular crystals.
- 

Porphyritic Granite. Coarse grained, quartz fairly abundant, large pinkish orthoclase feldspar crystals and small greenish masses of hornblende.
- 

Diorite. Medium grained. No quartz visible. Plagioclase in small roughly tabular crystals. Perforinagrestian minerals appear to be hornblende.
- 

Limestone. This is a fine grained, bluish limestone lying on the northern edge of the area. It is about 1300 feet thick on the average.

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