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August 30, 1957

Board of Directors,
Centroid Consolidated Mines
650 North 1st Ave.
Phoenix, Arizona

Gentlemen:

Herewith is the original and five copies of my Geologic and Engineering Report on your Centroid Mine property in the Ellsworth Mining District, Yuma County, Arizona.

The report includes three components, namely, the basic report, a separate report discussion of my recommendations to the Board Members and the section which includes the maps and drill logs. The original and two copies contain all three sections whereas the remaining three copies lack the separate report discussion of the recommendations. The original should always be retained in your files and the first two copies submitted to the SEC in the event you wish to issue a new prospectus. The remaining three copies may be used for the interest of your present stockholders or any third party which may be interested in the property and open for a deal.

The original tracings of all plates in the report and the Composite Drill Logs are retained by me for safe keeping in my map case but are yours for the asking at any time you wish to call for them.

The original and all copies are professionally stamped and the original and two copies are signed personally by me, the remaining copies having my name stamped as the signature.

It has been a pleasure to prepare this report for you. Many hours have gone into the report, much more than I shall be compensated for but I wanted to make as complete report as possible with the available information and realized the significance and importance of the report.

Sincerely yours,

R. E. Mieritz, PE.
Mining Consultant

**GEOLOGIC and ENGINEERING
REPORT**

of the

CENTROID MINE

of

CENTROID CONSOLIDATED MINES INC.

ELLSWORTH MINING DISTRICT

YUMA COUNTY, ARIZONA

by

**R. E. Mieritz
Mining Consultant
Phoenix, Arizona**

August 30, 1957

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CONCLUSIONS

The writer forwards the following conclusions which are founded and resulting from a personal examination and study of the Centroid Property.

- (1)- The Ellsworth Mining District in which the Property is located, is a forgotten but a good potential copper producing district as evidenced by some early production reports and records from 1918 to 1924. The principal interest at that time being the gold and silver associated with the copper mineralization. The present interest should be the production of copper. The associated gold and silver values would support a milling operation,
- (2)- The Centroid Property is in a setting of much surfaced exposed copper and iron mineralization as evidenced in the many cuts, pits and shafts within and without the property,
- (3)- Development of a low grade copper body in the vicinity of the Horse Whim area is highly possible. The possibility exists to the north and northeast of the existing drill exploration completed as of this writing,
- (4)- The development of high-grade copper is possible in the fissure system to the north of the Horse Whim area and same must definitely be explored by drilling.
- (5)- That District-wise, sufficient moderate grade copper material could be developed and available to a mill servicing the district and,
- (6)- The sulphide mineralization evidenced on the property and in the district should easily be amenable to a simple flotation process with expected high recoveries.

INTRODUCTION

The Centroid Consolidated Mines copper property in the Cunningham Pass area, Ellsworth Mining District, northern Yuma County, Arizona was studied and examined by the author to obtain information from which a comprehensive

geologic and engineering report on the property could be prepared.

This work included a study of early reports and maps available from the files of the Company. The writer personally completed a plane table geologic survey of the property, supervised a limited sampling program, prepared maps, sections, etc, logged the core obtained from previous exploration and mapped geologically the underground workings accessible at the time of the examination and compiled the available data included in the Companys'files. The report therefore incorporates all the available early and current information along with the thinking and opinions of the writer as defined by his examination.

This report has been prepared at the request of the Centroid Consolidated Mines Board Members. Much acknowledgement is due Mr. J. C. Kostelnik, Secretary, for his unlimited cooperation and time and also to the Board Members for their cooperation.

PROPERTY

The Centroid Consolidated Mines property enhances forty-five contiguous standard lode mining claims. Thirty-three claims are held by right of location whereas twelve claims are patented under Mineral Survey 4333, dated October 3, 1950. A list of the claims follows:

Patented Claims

Black Hawk	Centroid No. Fifteen	Hancock No. 1
Black Hawk No. 1	Jubilee No. 2	Hancock No. 2
Black Hawk No. 3	Jubilee No. 4	Hancock No. 3
Centroid No. Four	Jubilee No. 5	Hancock No. 4

Unpatented Claims

Jubilee No. 3	Centroid No. 5	Centroid No. 17
Oversight	Centroid No. 6	Centroid No. 18
Hancock No. 5	Centroid No. 7	Centroid No. 19
Capella No. 2	Centroid No. 8	Centroid No. 20
Capella No. 3	Centroid No. 9	Centroid No. 21
Capella No. 4	Centroid No. 10	Centroid No. 22
Capella No. 5	Centroid No. 11	Centroid No. 23
Capella No. 9	Centroid No. 12	Centroid No. 24
Centroid No. 1	Centroid No. 13	Centroid No. 25
Centroid No. 2	Centroid No. 14	Seven "D"
Centroid No. 3	Centroid No. 15	Our Lady

The contiguous group of claims are in Sections 7, 18 and 19 of Twp. 7 N., Rge. 12 W. and Sections 12, 13 and 24 of Twp. 7 N., Rge. 13 W., Gila and Salt River Base and Meridian, Ellsworth Mining District, Yuma County, Arizona.

All claims are valid, sufficient work having been completed prior to and during the year 1956-57 for the thirty-three unpatented claims and the 1956 taxes paid for the twelve patented claims. Affidavits of Performance of Annual Assessment work are recorded at the County Records Office, Yuma, Arizona.

The property lies astride of and surrounds Cunningham Pass in the Harcuvar Mountain Range which separates Butler Valley to the northwest from McMullen Valley to the southeast. For the most part, much of the property is alluvium covered with gentle slopes to the southeast. Rugged and steep slopes comprise the balance of the property.

Climate-wise, the property is ideally located for an all year continuous operation of exploration, underground or surface mining and milling. Except for occasional precipitation as rain or snow, the area is arid. The mean elevation is approximately 3000 feet with a range of some 200 feet a-

bove and below this mean. No Topographic maps are available of the area.

HISTORY

Occurrences of gold, silver and copper have been known to exist in the Ellsworth Mining District for the better part of 60 years. This is evidenced by the value of the production for which the District is credited, being in excess of a million and a half dollars. Shipments were primarily for gold, copper being secondary in thought, but the present day dollar value for copper exceeds that of gold. This production came from such mines known as Critic, Bullard, Little Giant, Black Giant and Black Reef. The Black Reef adjoins the Centroid on the southwest and the first three mentioned mines adjoin the Centroid on the northwest. The Black Giant adjoins Centroid on the northeast.

Copper contents up to 35% had been reported in veins from $1\frac{1}{2}$ to 6 feet in width in the various mines mentioned. The major portion of these reported copper contents are, no doubt, sulphides such as bornite, chalcopyrite and chalcocite.

ADJOINING PROPERTIES

The adjoining properties herein mentioned and commented upon are so included because the writer feels they are and can become a very important contributing factor which must be strongly considered in any future plans formulated by your Company.

In addition to the previous mentioned mines, there is

one unproductive property, the Sarah Mine, which is worthy of discussion also. Each property is briefly commented upon in the following:

Critic Mine:

This mine is located west-northwest of the Centroid and is credited with 3/4 million dollars in production. Shipments assayed \$15 to \$75 (old price) in gold and 10 to 25% copper. The mine is developed by a main shaft 475 feet deep, several short winzes and in excess of 2000 feet of drifts. The upper portion of the mine had been worked from an adit level whereas the deeper ore had been worked from the main shaft.

At present, the mine is flooded to some extent, thus limiting any real examination, however, upper portions of the copper bearing structure were visible on the surface. A very brief examination of the mine was made by the writer.

Copper minerals occurring in the quartz gangue filled fissure are sulphides such as chalcopyrite, chalcocite and bornite. Some oxide copper is present on the surface and indications on the dumps assumes the oxides had not carried to any great depth. The fissure is very strong and persistent with a dip of 70° E. and a N. 30° W. strike length of some 500 feet. Even though the structure shows strength in the stopes near the surface, the surface expression of the structure is not overly impressive. Wall-rocks in the stopes appear quite fresh with little evidence of alteration but with much associated blood red specular hematite. The writer doubts the possibility the mine has been worked out and he feels there is

much ore available which could be a great asset to a mill in the area.

Bullard Mine:

The Bullard Mine, immediately adjoining the Centroid property on the northwest, is developed by several adits on the vein and a 225 foot shaft down dip on the vein from the lowest adit. Copper ore was experienced for the full depth of the shaft.

This structure, like the Critic vein, is a quartz gangue filled fissure containing sulphide minerals as chalcopyrite, chalcocite and bornite. Copper values are reported to average 4 to 5% copper with some high-grade containing up to 15% copper. The ore also contains approximately \$5.00 in gold. Here again, wall rock alteration is very slight, however, much blood red specular hematite is in evidence and is usually on one or the other walls of the fissure, seldom intimately associated with the quartz gangue.

Although much ore has been mined from the adits above, *the* writer feels there is considerable ore available below the lowest adit level, the grade of which should approach or equal the previous mentioned average. This thought is indicated by the presence of ore material in the shaft.

Black Giant Mine:

The Black Giant Mine adjoins the Centroid property on the northeast. The property is developed by a 400 foot incline shaft. Little is actually known of this mine except the usual rumors. ^{Hanbook} needs Hanbook of Mines, 1922 states " the ore opened up on the 110 foot level and the orebody reported to be 25 to 100 feet long with a nearly vertical dip. The property is an

attractive prospect".

Black Reef Mine:

The Black Reef property located immediately southwest of the Centroid is developed by a 400 foot shaft, inclined on the dip, the bottom of which is in ore. Ore below the 300 level assayed \$3 to \$40 in gold and 3 to 35 % copper. The vein is reported to be 2 to 3 feet wide with swells up to 6 feet at the 100 foot depth.

This structure is unlike any in the district since its gangue material is siderite, an iron carbonate. Examination of the dump material indicates sulphide copper mineralization is present as chalcopyrite, chalcocite?, and bornite. Some oxides are also present. The siderite outcrop is a distinct landmark as a protrusion above its surroundings by four to six feet and visible for 500 feet along its east-west strike. Very little blood red specular hematite was evidenced within this structure. No doubt there is much tonnage that could be developed.

It is my understanding this particular group of claims are currently the object of a law suit now pending or in the process. The property could contribute much to a district consideration.

Sarah Mine:

The Sarah Mine adjoins the Critic on the southwest and lies approximately $\frac{1}{2}$ mile northwest of the Centroid property. Although undeveloped except for an inaccessible 200 foot shaft, the writer was able to observe the outcroppings, strength and trace the strike for several hundred feet. Oxide

and sulphide copper mineralization was evidenced in the outcroppings and the shallow pits exposing the structure. The possible tonnage of moderate grade copper material in this structure definitely is a great potential to a district consideration.

FACILITIES

Facility-wise, the Centroid property is ideally situated for interruption free all year mining and milling operations. This same condition exists utility and transportation-wise. The availability and accessibility of these facilities are discussed below:

Transportation:

The Centroid property is serviced by a County maintained, well graded graveled all weather thirty foot wide road from Wenden, Arizona. This road traverses Cunningham Pass and divides the property into east and west halves. The Artillery Peak manganese area, several miles to the north, is also served by the same road. Grades are favorable to loads for the 12 miles south from the property to Wenden. Wenden itself is located on U. S. Highway 60-70 and on the main line of the Santa Fe Railroad servicing cities both east and west. A railroad loading ramp is available, this being located at a siding in Wenden.

Electric Power

A three phase high Tension power line constructed by the Bureau of Reclamation parallels the road for the most part across the property. The carrying capacity of this line would

amply supply any power demand required by a mill operation and townsite. Service lines of no more than a half mile distance would be required.

Gas (Natural):

A natural gas pipe line crosses the Centroid property in much the same direction as the Power Line, consequently, any connection to this gas line would require but a short service line to any point within the property.

Water:

Water for any exploration or mining operation can be obtained from one of the several shafts in the immediate area. The Main Shaft, Van Eck and the Black Reef Shaft all have water standing at not too great a depth. Early reports indicate that the Black Reef Mine shaft could provide a 25,000 gallon per day supply. To be reasonably sure of a reliable water supply, such would have to be developed. The most accessible and assurable area is immediately south of the property in McMullen Valley which is currently under agricultural development.

Timber:

Since the immediate area of the property is semi-arid and typical desert conditions exhibited, timber for construction and mining purposes must be imported to the property. This however should be little trouble since Prescott and Flagstaff are not too far distant and served by the Santa Fe Railroad.

Housing:

The property is well equipped at this time, with minor repairs, to accommodate a working force of ten to fifteen men on a single status basis. Since the tremendous popularity of

house trailers has made many a camp over-nite, the housing problem would cause little concern. Schools, stores of small size and automotive supplies are available at Wenden, which is currently experiencing slight growing pains because of Valley development.

The present camp includes such buildings as an office, tool-warehouse and several comfortable bunk houses. A portable change room including showers, is located near the Horse Whim Shaft.

Equipment:

Much useful equipment on the property is currently idle. A complete inventory list is included in your office files, consequently to duplicate that list here would be of no importance. A general mention of the type equipment is however warranted.

The Horse Whim Shaft is completely equipped with a $1\frac{1}{2}$ ton incline skip and hoist of sufficient horse power to operate same, rails to lowest level, water and air lines, and ventilation lines. The shaft is also equipped with electric lines for lighting. A 10KW electric plant housed in its own building supplies the energy for lighting the camp buildings and other installations on the ground. A check of the wiring would be necessary before the system is put to use. The tool-warehouse contains such items as air drills, steel, picks shovels, etc. The Main Shaft is currently used for a domestic water supply, except for drinking purposes, and is equipped with the necessary pipe and pump. Much air and water lines are placed to some of the workings along with several water tanks, one large water supply tank being located at the

Main shaft.

GEOLOGY

General:

The mass rock unit responsible for the rugged steep sloped Harouvar Mountains in the immediate vicinity of the Centroid property is a gneissic granite or granodiorite of Arkean age which is in contact with a pre Cambrian granite on the south that forms the low foothills and the wide McMullen Valley. Megoscopic examination of the Arkean gneiss shows quartz to be the major constituent, in some instances 60 to 70%, while subordinant dark minerals forming irregular bands are hornblend and/or augite and biotite.

Dikes of diorite-d diabase series along with those approaching a pegmatic texture were observed in several areas. In these areas, the gneiss becomes very feldspathic, containing better than 50% feldspar in places. It is believed this condition is attributed to the recrystallization of the rock constituents within the gneiss which was brought about by the metamorphic process producing the gneissic texture as well as the pressure resulting from the mountain building period and the intruding dikes. Some of these feldspathic features might readily be mistaken for pegmatite dikes upon first examination. No sharp contacts between rock types were observed except between the diorite-d diabase dikes and the surrounding rock. The contacts drawn on the geologic maps are therefore a contact of arbitrary location which represents the mean of a gradational contact between two rock

types previously described.

In an earlier report by Mr. A. Tovote it is stated, "Other intrusions are dikes of diabase or diorite, or both. Near Cunningham Pass these dikes resemble diabase, but further west, they are decidedly diorite."

Diorite-diabase dikes varied in width from less than a foot to some 70 feet. The dip of the random striking dikes varies from 55 to 85 degrees east.

The pegmatite dikes are so classed because of their larger crystal habit although they are not as well developed as in a typical pegmatite. There is sufficient difference between this rock type and the gneissic granite to warrant its separate classification. These dikes vary in width from a few feet to as much as 1600 feet and have dips similar to the diabase-diorite dikes.

No age has been assigned or attempted except to herewith state their order of sequence. The original gneissic granite or granodiorite, through metamorphism, has in places been changed to a pegmatic gneissic granite. In turn, a more pegmatic material as dikes invaded the area. Diorite-diabase dikes then invaded all rocks present. Copper, gold, silver and iron mineralization was simultaneous with and/or shortly followed the diorite-diabase dike intrusive period, but not limited to the diorite-diabase dikes.

Local:

What has previously been discussed under regional geology is also the observed conditions within the boundaries of the Centroid property. The structural and mineralized features within the property are of utmost importance and are

commented upon in the following paragraphs.

Four structures have been the object of moderate development which are, in the opinion of the writer in the order of importance, the Horse Whim zone; a very pronounced structure system south of the power line near the western border of the property; the Van Eck vein and quartz iron stained gossan fissure east of the Wenden road.

The Horse Whim zone, presumably a shear zone, is a N. 45° W. striking structure dipping 35° NE. is moderately altered and contains copper mineralization some of which appears to be secondary enriched as contrasted to the mineral percentages encountered in the drill holes which intersected the projection of this zone down dip. This zone is approximately fifty feet thick as defined by drilling and underground development. Much associated blood red hematite was observed along with the copper minerals of chalcocite, chalcocite and possibly bornite. Very little oxide copper is in evidence. This structure must be explored by drilling to the north and northwest.

The steep northeast dipping fissure system accompanying the pegmatic dike near the power line is a strong vein type structure of blood red hematite and copper mineralization. This structure is developed slightly by small cuts and a few shallow shafts, many of which are not accessible to examination but the dumps indicate copper mineralization for its observed strike length. One dump sample assayed 2.12% copper. Although the vein appears to be narrow, 1½ feet, at the surface, the history of the district indicates an increase in width

with depth for these steep dipping veins, Critic, Bullard, etc. This system must also be explored by drilling.

The Van Bek vein striking east-west and dipping 54° to the north is a moderately strong blood red iron fissure, continuous for 30 feet westerly, contains copper oxide and sulphide minerals. The vein is narrow, 2 feet wide, with foot and hanging walls of slightly altered gneissic granite. Little is known about this structure since the inaccessible shaft will not permit examination. Dump material indicates good sulphide copper mineralization at depth. The close proximity to the Horse Whim zone may make for good ore possibilities at their intersections. Some exploration is necessary.

The yellow, brown iron stained gossan fissure on the Black Hawk claim strikes N. 60° W. and dips 55° to the northeast, is a weak but quite persistent structure which parallels a sporadic diabase dike. Weak copper oxides were observed in the narrow 2 foot fissure. Except for a possible gold content, this structure holds little promise as a possible productive vein.

Mineralization:

The age and source of the copper and iron and the associated mineralization is not positively known, however, since the mineralization is evidenced in the diorite-diabase dikes it is reasonable to assume they are coincidental or later than this rock unit. The shrinkage fractures of the metamorphosed rocks and subsequent fracturing within the dikes produced the structures presently carrying the mineralization.

Mineralization appears to be more prevalent in areas of pegmatic intrusions more so than in areas lacking this type structure. This fact could indicate that the pegmatic structures or the magma from which they originated could well have also supplied the iron and copper mineralization.

The copper minerals observed within the property are chalcopyrite, bornite, chalcocite, covelite, azurite and malachite. The principal gangue minerals being blood red specular hematite, yellow-brown limonite, siderite, quartz and small amounts of barite.

DEVELOPMENT

Much development has been completed on the property. Some of this dates back to 1910 and consists primarily of shallow shafts and pits the old prospectors completed in search of gold bearing fissures, paying little attention to the copper value contained in the vein itself. The majority of the development however has been completed relatively recent and includes such work as shaft deepening, underground work and surface diamond drilling.

Unfortunately the exploration completed was done under two separate managements within your organization and it dates back to 1936. After legal proceedings and termination of receivership, the present active management has coped judicially with the several then existing problems. One such problem was the failure to receive all records and information from the early managements' files. Such specific information lacking were portions of core from two drill holes, assays and records of samples taken in the Horse Whim Shaft and its

workings and transit survey notes of the Horse Whim Shaft and other underground workings. This condition required much work to reconstruct such records and information as one step towards judiciously proceeding with the development of the Centroid property through professional guidance then accepted. Unreplenished funds contributed to and accounted for sporadic and limited development these past few years.

Early management thought it advisable to develop the Horse Whim structure by deepening the inclined shaft and completing several hundred feet of drifting. Unfortunately the direction of the shaft is raking south from the general trend of the mineralization. Early management also completed the Main Vertical Shaft and its long 600 foot crosscut 300 feet below the collar. Object of this work was to intersect the Horse Whim zone at a depth below the inclined shaft bottom. The writer believes the target was intersected since some records reported intersecting copper mineralization about 300 feet south of the Main Shaft. A second reason for this work was to provide a good haulage exit for the suspected ore. Early management also completed 200 feet of adit drifting and crosscutting beneath the large blood red specular hematite outcrop and drilling of ³ diamond drill hole ^{net,} totaling 750 feet in depth.

Receivership management completed one diamond drill hole at a depth of 366 feet during June, 1954.

All subsequent development has been completed by the present active management which has included drilling six diamond drill holes totaling 2,694 feet, sampling of the

Horse Whim Shaft and its workings and providing for a geologic and engineering report.

Most of the exploration completed was concentrated in the Horse Whim area. This work included drill holes 2, 3, 6, 7, and 8. Each drill hole is separately discussed below. Logs of all holes except number 1, drilled by early management, is included in the appendix of this report.

Diamond Drill Hole 2 was drilled as part of the annual assessment work while the organization was in receivership. The presumable target of the -85° dip hole was the Horse Whim structure and to intersect same east of the Main Shaft South crosscut. The target was intersected as an oblique 46 foot zone of heavy blood red iron and highly altered zone containing copper as chalcopyrite, chalcocite? and bornite with associated pyrite. Core recovery in this zone was extremely poor, recovering (present available core) but 8 feet for the 46 feet drilled. It was rumored that some high grade ore was recovered. No doubt core recovery was better than presently indicated. Present management did not have access to this core until just recently. The intersection of this mineralization is one point on the projection of the Horse Whim zone. The mineralization was encountered at a depth of 320 to 366 feet.

A note of interest at this point is the rumored copper mineralization encountered in the Van Eck Shaft drift which from old records parallels the Horse Whim structure at a depth of 325 feet down dip from the collar of the Van Eck Shaft. The relative elevation-wise and horizontal position

of this drift, the mineralization in the long crosscut of the Main Shaft and the projection of the Horse whim structure below its known depth in the Shaft become one and the same. It is difficult to show this correlation and relation in sections because of the various directions of the existing workings, however, an attempt has been made in Sections A-A' and B-B', plates 5 and 6. Good copper and gold ore is reported to have come from the Van Eck drift. The reason for such good ore could be the intersection of the Horse whim structure with that of the Van Eck structure at the point that drift work began.

After termination of receivership, the present management continued exploration of the Horse whim structure by diamond drilling the following holes in sequence under the guidance of previous professional assistance. Except for a laymans geologic log by one of the Board Members, no other records were kept or submitted by the previous professional assistance retained. Composite Logs of each hole has now been completed and included in the appendix of this report. Each hole is herewith commented upon:

Diamond Drill Hole 3 was drilled some 200 feet southwesterly of the small cabin east of the office building in the camp. The hole was directed toward the projection of the Horse whim structure in line with the direction of the Shaft. This hole was not successful in intersecting a well defined high grade copper structure as was anticipated. The hole did intersect an area of some 60 feet from 400 to 460 from which poor ore was recovered. This zone showed weak alteration

of the pegmatic rock containing blood red iron seams and sparse chalcopyrite. The zone conforms well with the projection of the Horse Whim structure.

Diamond Drill Hole 6 was directed and drilled to explore the Horse Whim structure and penetrate the target some 500 feet down dip in an easterly direction from the last known information at the Shaft bottom. Except for a 25 foot zone of weak alteration from 550 to 575 feet, the entire hole penetrated fresh gneiss and pegmatic granite. The zone itself and for several feet above and below contained stringers of blood red iron with visible paper thin strings of chalcopyrite and pyrite. This zone conforms extremely well with the projection of the Horse Whim structure.

Results of holes 3 and 6 indicate the weakness of this structure of an an line projection of the structure in the Shaft. Exploration is therefore warranted laterally rather than down dip.

Diamond Drill Hole 8 was located, directed and drilled to intersect the Horse Whim structure approximately 100 feet down dip and directly ahead of the Shaft bottom. The target was intersected as a 50 foot zone from 210 to 260 feet, was moderately altered and contained several stringers of blood red iron with visible copper as chalcopyrite, possible chalcocite but no bornite. Again, the target lines up well with the projection of the structure. The weakness of the structure indicated by the three drill hole intersections establishes a down dip limit of the copper mineralization in the vicinity of the Shaft.

To obtain some information as to the grade of the structure, the writer supervised a limited sampling program of the available or accessible underground workings serviced by the Horse Whim Shaft and the Shaft itself. Samples were taken at ten foot intervals in the shaft and at near right angles to the dip of the structure as possible. Samples varied from three to seven feet in length, dependent on the unobstructed accessibility. The thirty two samples from twenty feet below the collar to the bottom level, 320 feet, has a weighted average of 1.048% copper as compared to the arithmetic average of 1.052% copper. Because of bad, caving ground in the various levels, only erratic sampling could be accomplished. All samples and assay results are indicated on Plate 7.

Diamond Drill Hole 7 was directed and drilled to test the area immediately below the prominent iron outcrop and the short adit completed by early management. The first 200 feet of the hole contained many stringers of blood red hematite in relatively fresh pegmatic gneissic granite. Very little copper was associated with the iron oxide stringers. Lack of copper mineralization is probably due to the suspected leaching in the zone. The hole location was but 150 feet horizontally from the structure outcrop. Excepting for a very few blood red iron stringers, no other mineralization was evidenced below the 200 foot depth.

The 40 to 50 foot thick Horse Whim structure definitely has not been tested sufficiently in a lateral direction to voice a negative approach. On the contrary, exploration

should continue to indicate the existence of a low grade copper zone which could be adaptable to open pit methods and could materially contribute to a milling operation in the district.

Exploration as two diamond drill holes, 4 and 5, one each on separate structures, were drilled on the eastern portion of the property.

Diamond Drill Hole 4 was drilled to intersect copper and yellow brown iron stained structure coincidental and associated with a sporadic diabase dike. This particular structure was previously referred to as the Cunningham Pass fault. During the examination, the writer was unable to trace this structure north beyond the main shaft located on this vein. The structure can however be traced for 1200 feet to the south, being narrow but definitely identifiable by its iron stain. The drill hole intersected its target by penetrating a 25 foot zone of quartz from 210 to 235 feet. This zone was void of copper mineralization and contained very little iron stain. A short five foot zone from 140 to 145 feet showed some copper as chalcopyrite with some iron staining.

Diamond Drill Hole 5 was drilled to test the down dip projection of an exposed narrow, minor iron stained structure on which a short shaft had been sunk. A granular quartz zone of 45 feet was intersected from 170 to the bottom which exhibited some alteration, few strings of blood red iron and an occasional speck of chalcopyrite. This intersection could well have been the target.

Diamond Drill Hole 1 was drilled by the early management. No geologic record was ever received by the present management,

consequently no Composite Drill Log is possible. Several boxes of core had been dumped on the ground at the drill site and beneath the floor of the tool-warehouse at Camp. The wooden blocks denoting footages are scattered in all directions, some are in place but the weather has destroyed the numbers such that they are not legible. A general review of the core available indicates that much of the rock penetrated is fresh gneiss with moderate mica and good lamination along with small areas of a pegmatic material which the writer has been classifying as pegmatite. An occasional thin seam of blood red hematite was evidenced but the depth could not be determined.

The drill site was located some 850 feet south south-east of the Camp. The vertical hole intended to intersect an eastern dipping red hematite fissure located 200 feet west of the drill location. Copper oxides and sulphides were in evidence in the dump of this caved shaft on the fissure. A check of the old invoice indicates this hole was drilled to a depth of 750 feet. More than likely, if any mineralization of importance would have been encountered in the hole it would not have been left lying on the ground in the places mentioned. It is the writers opinion this hole is located too far south to indicate the possible existence of any large body of primary chalcopyrite mineralization.

ORE RESERVES

Unfortunately there is not sufficient information on which to justify a sound ore reserve calculation. The best reserve possible at this time is an inferred tonnage of 60,000 tons of copper ore which would average about 1% copper and a

small amount of gold. The Horse Whim zone is credited with the inferred tonnage, representing a block 50 feet wide (25 feet on each side of the shaft), 35 feet thick and 400 feet down dip. A cubic foot factor of 12 was used.

It is the writers opinion that this tonnage can be enlarged considerably by limited and well planned exploration such that the cost per ton developed is not in excess. Moreover, there are other favorable structures which could contain many tons of a higher grade ore but which must also be developed by proper and adequate exploration.

EXPLORATION POSSIBILITIES

As a result of the examination, several potential areas of geologic interest must be considered for development by exploration.

The first of these areas is the Horse Whim zone. A 1200 foot by 400 foot area north of the Horse Whim Shaft should be progressively drilled northward with shallow holes to penetrate the zone. Should the drilling program be successful for the entire block, a reserve of considerable tonnage is possible. The added drill information may point to other possibilities which could materially increase this reserve.

Holes drilled should be spaced at 150 foot intervals in a N. 40° W. direction as two lines which are 200 feet apart. All holes should be vertical, collared NX size and drilled BX size to the bottom if possible. One line is intended to intersect the zone at a shallow depth, 100 to 125

feet, the second line to intersect the zone 100 to 150 feet deeper in depth. An aggregate of some 4000 feet of drilling can be expected. A shallow hole on the first line must be completed before the down dip deeper hole is started. This progressive drilling campaign would reduce any unnecessary drilling and expense.

A second area of importance is the strong fissure system just southwest of the power line and north of the Horse Whim area on the Hancock No. 2 and Centroid No. 17 claims. The fissures of this system are for the most part steep dipping to the east and the physical character more nearly approaches that of the Bullard and Critic structures. This area must definitely be explored by drilling, first with shallow holes of penetration along the strike with a series of holes to penetrate at a deeper depth. The potential of these structures developing high grade copper ore is extremely good. Only limited surface pits and shallow shafts have explored the system, all exposures showing copper mineralization. A shovel grab sample representing all parts of the dump of the deepest shaft and most southern working contained 2.12% copper and .21 ounces of gold. Although oxide copper and sulphides were visible on other dumps of the system, they were not sampled because the workings just barely exposed the mineralization and the sample would not be representative of the structure.

Other areas of interest and possible potential exist within the property but which currently geologic interpretations and evidence are not sufficient to permit the writer to just-

ify any conclusions or definite statements. Until the required geologic evidence has been brought to light by the planned drilling programs outlined, no opinions can be given nor would I suggest money be spent on an idea not backed by ample evidence.

RECOMMENDATIONS

The writer wishes to make the following recommendations which should be considered as a means of developing the Centroid Mine and putting it on an operating basis if possible.

- (1)- Explore the Horse Whim zone by diamond drilling as indicated under "Exploration Possibilities" to determine the north and northwest extent of the zone,
- (2)- Explore by diamond drilling the strong steep dipping fissure system north of the Horse Whim area to determine the lateral and down dip extension of the surface exposures as outlined under "Exploration Possibilities", and,
- (3)- Consider the possibility of a mill which could serve the entire district. The smelter demands for concentrates rather than direct shipping ore are becoming more pronounced as time goes by.

* * * * *

Respectfully submitted,

E. E. Mieritz, P. E.
Mining Consultant
Phoenix, Arizona

Richard E. Mieritz
MINING CONSULTANT
307 E. INDIAN SCHOOL RD.
PHOENIX, ARIZONA
AMHERST 5-1607

August 30, 1957

Board of Directors
Centroid Consolidated Mines
Phoenix, Arizona

Gentlemen:

The following is hereby submitted as an addendum to the preceding Geologic and Engineering Report to entertain my previous recommendations more in detail to provide you a program of attack which should be followed to continue the organization of Centroid Consolidated Mines.

The preceding report was written in such light to advise you the merits, possibilities and potential of your property and also to advise in a general way what should be done in the way of exploration to develop the property and approach an operation. It was also written to provide adequate information for a possible third party who might become interested in the property for exploration on a lease-purchase basis.

This addendum therefore becomes a part of the original and two copies of my report but is directed only to the Board of Directors and the information contained herein should be discriminately used by them, that is, it should not be made publicly known except when needed or required by reason of interest to advance the position of the Company.

As previously mentioned we have two avenues which can be followed either simultaneous or individually one at a

time. These avenues are for your organization to carry the load and responsibility of a new prospectus or to find some organization to purchase the property on a lease-option to purchase basis. The latter might be the easier but possibly more time consuming. The former course would be the most laborious but in all probability the more feasible and self and publically acknowledged if the route went the full distance of "profits to the stockholders".

There are two primary recommendations, the first being exploration of two important areas on your property and the second that serious consideration be given the thought of a mill for the district.

I have outlined in a general way the necessary exploration required for the two areas. For your purpose of a new prospectus, some detailed information will be required which shall herewith be included. Moreover, such detailed information will also be included for a possible milling program. Each will be separately discussed.

CENTROID EXPLORATION

The Horse Whim area will require approximately 15 to 18 drill holes totalling about 4000 feet. Twelve of these holes are considered primary and the remaining three to six holes as secondary in nature, that is, they must be drilled as intervening holes if in my opinion they are required to provide the answer of any question between drilled holes.

The second area of importance, which shall be re-

ferred to as the Hancock structures, will require approximately ten 200 foot primary holes and as many 350 foot holes for a grand 5,500 feet. This structure system is important and is well deserving of the footage assigned to it. Actual drill locations will be spotted when the opportune moment arrives.

The following is an estimated cost of the above outlined drill program.

9,500 ft. drilling (Churn or/and Diamond)	\$57,000
Avg. \$6.00/ft	
20% for reaming, cementing, casing, etc	11,400
Roads and locations	3,000
Sampling and assaying-Avg. \$1.00/ft	9,500
Supervision, Logging, etc	7,500
Contingencies, 10%	<u>9,000</u>
Total	\$97,400

Approximate development cost of \$0.07/ton.

CUSTOM MILL FOR DISTRICT

The second primary recommendation suggested the thought of a custom mill in the district which could not only serve your property but would accept ores from other nearby, now existent properties known to have copper ore available for production if such a mill were established and operating. Too many mills are built before the owners have ample ore available. In this instance and at this time, your property does not have sufficient ore tonnage indicated to justify a mill, however, there is ample evidence that sufficient ore is available in three or four nearby mines which would justify such a mill. Moreover, a mill would stimulate prospecting and development in the district. This coupled with the ore reserves to be developed by your exploration

will definitely support a justified mill.

Two schedules of timing for the construction of a mill are possible, (1) partially complete the simultaneous exploration of the Horse Whim zone and Hancock structures to indicate a portion of the reserves suspected and (2) plan construction as soon as possible, contacting the mine owners to get their properties into production, either they themselves or Centroid Consolidated Mines as the operators of the mine operation. It is the opinion of the writer that the first schedule of timing is more appealing and justified. My writing will therefore represent the conditions surrounding such a schedule.

Assuming that 30 to 50% of the indicated exploration has been completed and such results obtained that some 500,000 to 700,000 tons of approximately 1% copper ore will have been indicated for the Horse Whim area and some 30,000 to 40,000 tons of 4% or better copper ore indicated in the Hancock structures, a gross value of some \$3,600,000 in copper value alone is represented by these tonnages in place. These tonnages alone would justify a 200 ton per day mill, but that is not enough to just justify one, you will need excess reserves to warrant continued operation and expansion. Additional reserves are therefore available through the completion of the exploration program and from the nearby mines other than Centroid. The following table is therefore presented to indicate the scope and possible reserves of the district as the writer believes they could exist.

(Table on next page)

<u>Mine</u>	<u>Reserves</u>	<u>Type</u>	<u>Grade</u>	<u>Value (27¢ copper)</u>
Centroid	1,250,000	Inferred	1%	\$ 6,750,000
" "	100,000	Inferred	4%	2,160,000
Critic	100,000	Indicated	4%	2,160,000
Bullard	75,000	Indicated	4%	1,625,000
Sarah	100,000	Inferred	4%	2,160,000
Black Reef	75,000	Inferred	4%	1,625,000
Totals	1,700,000	average of	1.8%	\$16,480,000 (in place)

A 200 ton per day capacity mill could be figured at a \$2000 price per ton for new equipment, thus a possible \$400,000 investment. There are many used mills around, some of which are good buys, others are not. It is the opinion of the writer that a 40% to 60% saving could be effective by purchase of a used plant. A reduced investment of \$160,000 to \$240,000 would then be required, perhaps less. A custom mill always works in favor of the operator and usually carries at least a \$1.00 to \$1.75 or more profit per ton of custom ore milled. The inferred ore tonnage of the nearby mines is 350,000 tons for a possible profit of \$350,000 to \$610,000. This would more than pay for the capital investment of the mill besides providing a low cost milling rate for your own ore.

The writer feels the installation of a mill at your property will stimulate prospecting activity and development in the district and should with proper management, planning and operation be a successful venture.

FINANCIAL RECAPITULATION

To enter into and carry to completion the above program will require the expenditure of much money. A recapitulation of the required funds is herewith provided.

ESTIMATED EXPENDITURES

Exploration

Horse Whim Area (Contract Drill'g.)	\$24,000	
20% for Extras	\$ 4,800	
Sampling & Assaying	\$ 4,000	
Supervision, Logging, etc.	\$ 4,500	
Contingencies, 10%	\$ 3,700	
Sub Total		\$ 41,000
Hancock Structures (Con't. Drill)	\$33,000	
20% for Extras	\$ 6,600	
Sampling and Assaying	\$ 5,500	
Supervision	\$ 3,000	
Contingencies 10%	\$ 4,800	
Sub Total		\$ 52,900
Roads and locations plus 10% (1/2 for each area)	\$ 3,300	
Sub Total		\$ 3,300

Mining

Contract the Mining Working Capital	\$50,000	
Sub Total		\$ 50,000

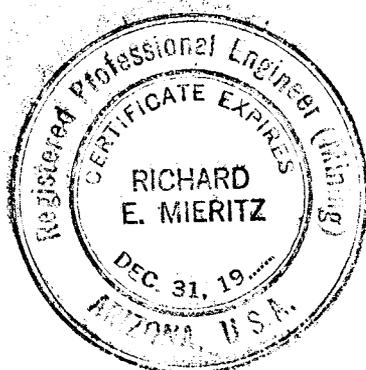
Milling

Mill purchase, construction, etc	\$200,000	
Facility development, water, loading and tailings	\$ 20,000	
Contingencies 5%	\$ 11,000	
Sub Total		\$231,000

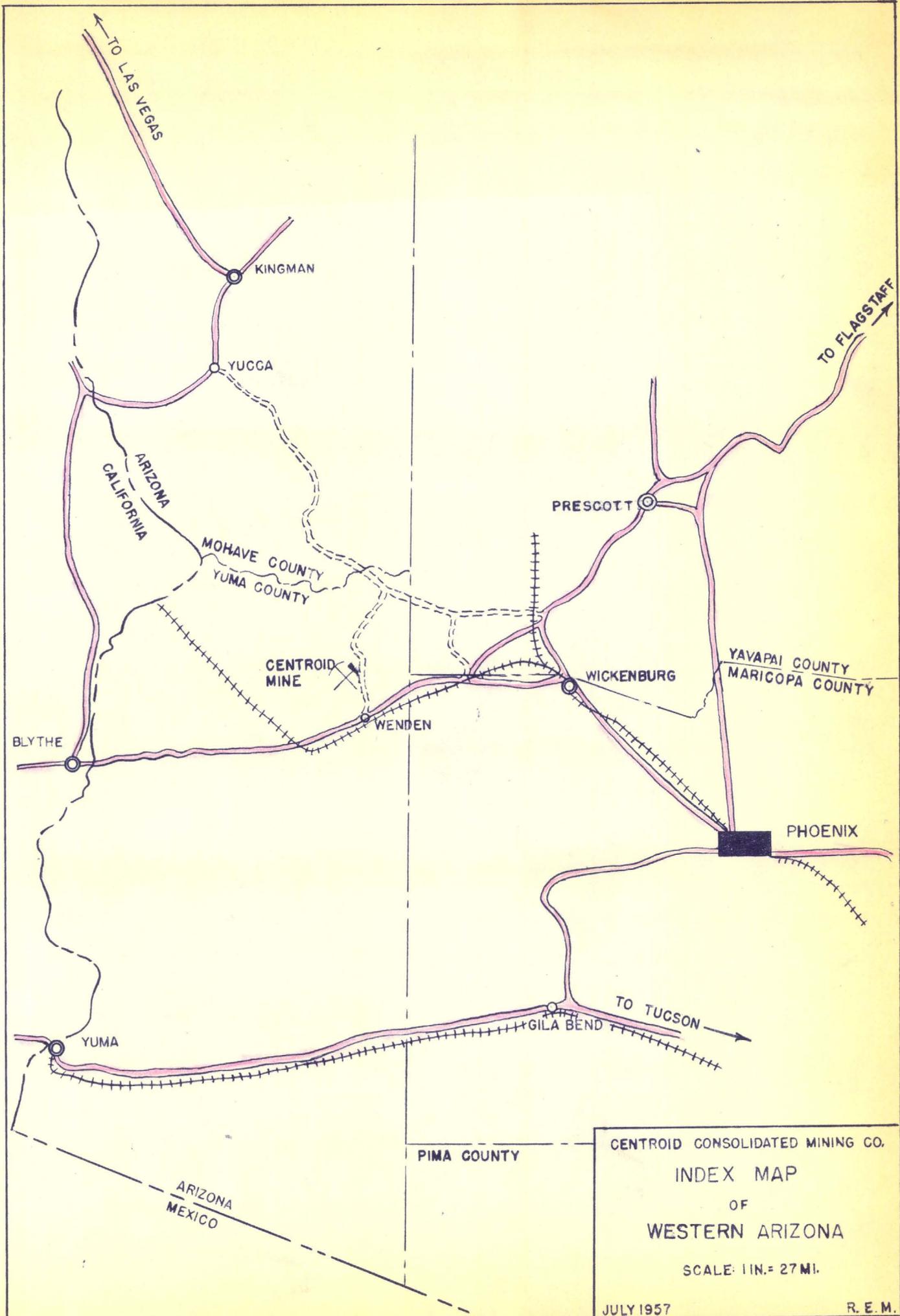
Total funds required-----\$378,200

The major portion of the expenditure is the purchase of the mill. Any purchase price below this figure will be a substantial saving, thereby reducing the required funds.

Respectfully submitted,



R. E. Mieritz, P. E.
Mining Consultant
Phoenix, Arizona



CENTROID CONSOLIDATED MINING CO.
 INDEX MAP
 OF
 WESTERN ARIZONA
 SCALE: 1 IN. = 27 MI.
 JULY 1957

R. E. M.



NOTE

Adjoining Patented Claims
(not Centroid Property)



CENTROID CONSOLIDATED MINING CO.

CLAIM MAP

CENTROID MINE

YUMA COUNTY, ARIZ.

SCALE: 1 IN.=1000 FT.

AUG., 1957

R.E.M.

T. 7 N.

18/17
18/17

18/17
19/20

R. 13-12 W.





- LEGEND**
- ALLUVIUM
 - PEGMATITE
 - PEGMATIC GNEISS (TRANSITION)
 - PRE-CAMBRIAN GNEISSIC GRANITE
 - DIABASE OR DIORITE
 - COPPER MINERALIZATION
 - IRON "
 - MINE WORKINGS

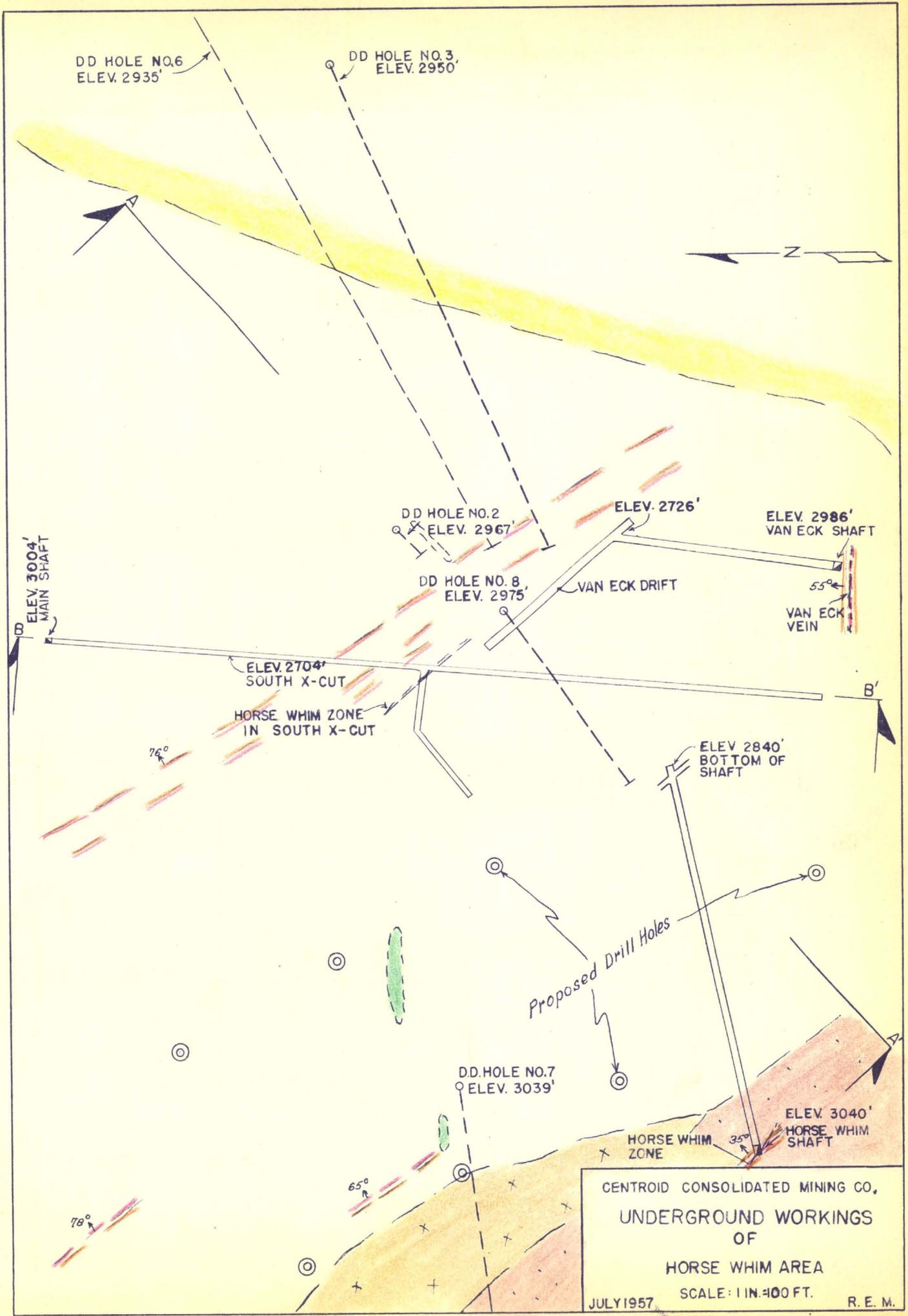
CENTROID CONSOLIDATED MINING CO.
SURFACE GEOLOGY
OF
CENTROID MINE

YUMA COUNTY,
SCALE
1 IN = 400 FT.

JULY 1957

REGISTERED PROFESSIONAL ENGINEER
CERTIFICATE EXP. 12/31/58
RICHARD
E. MIERITZ
ARIZONA
DEC. 29, 1916
MEMBER, U.S.A.

R.E.M.



DD HOLE NO.6
ELEV. 2935'

DD HOLE NO.3
ELEV. 2950'

DD HOLE NO.2
ELEV. 2967'

DD HOLE NO.8
ELEV. 2975'

ELEV. 2726'

ELEV. 2986'
VAN ECK SHAFT

ELEV. 3004'
MAIN SHAFT

ELEV. 2704'
SOUTH X-CUT

HORSE WHIM ZONE
IN SOUTH X-CUT

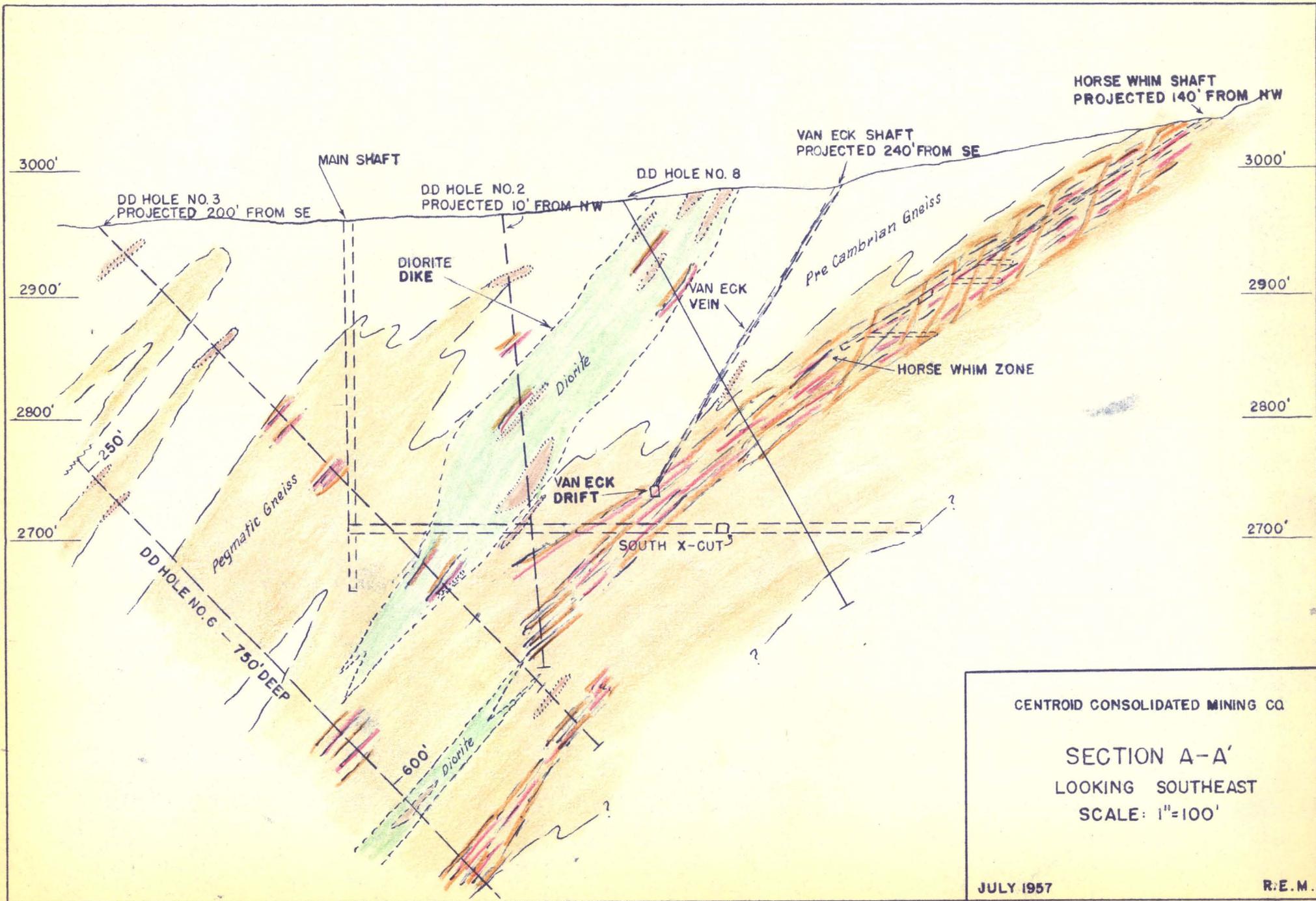
ELEV. 2840'
BOTTOM OF
SHAFT

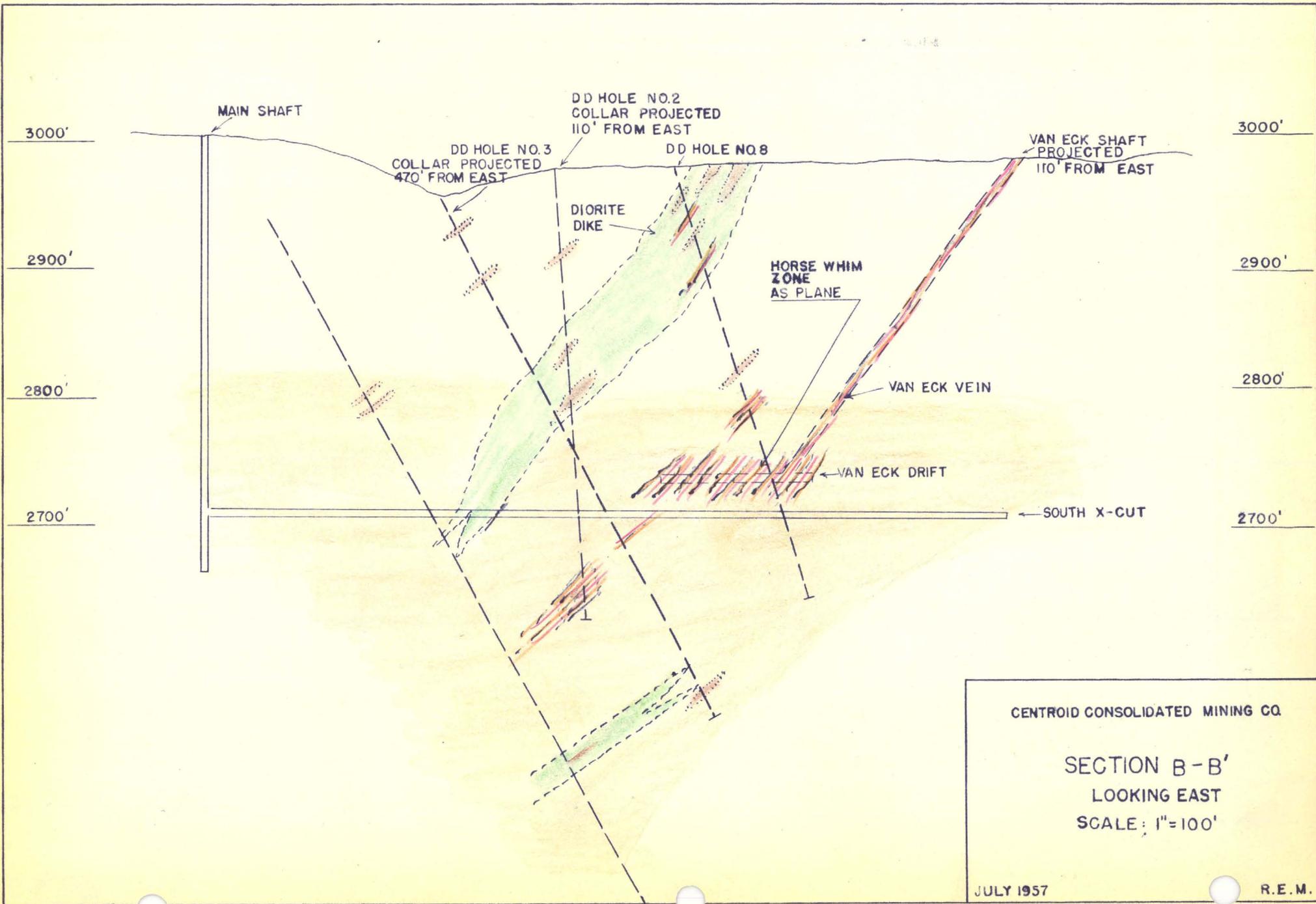
Proposed Drill Holes

DD.HOLE NO.7
ELEV. 3039'

ELEV. 3040'
HORSE WHIM
SHAFT

CENTROID CONSOLIDATED MINING CO.,
UNDERGROUND WORKINGS
OF
HORSE WHIM AREA
SCALE: 1 IN.=100 FT.
JULY 1957. R. E. M.



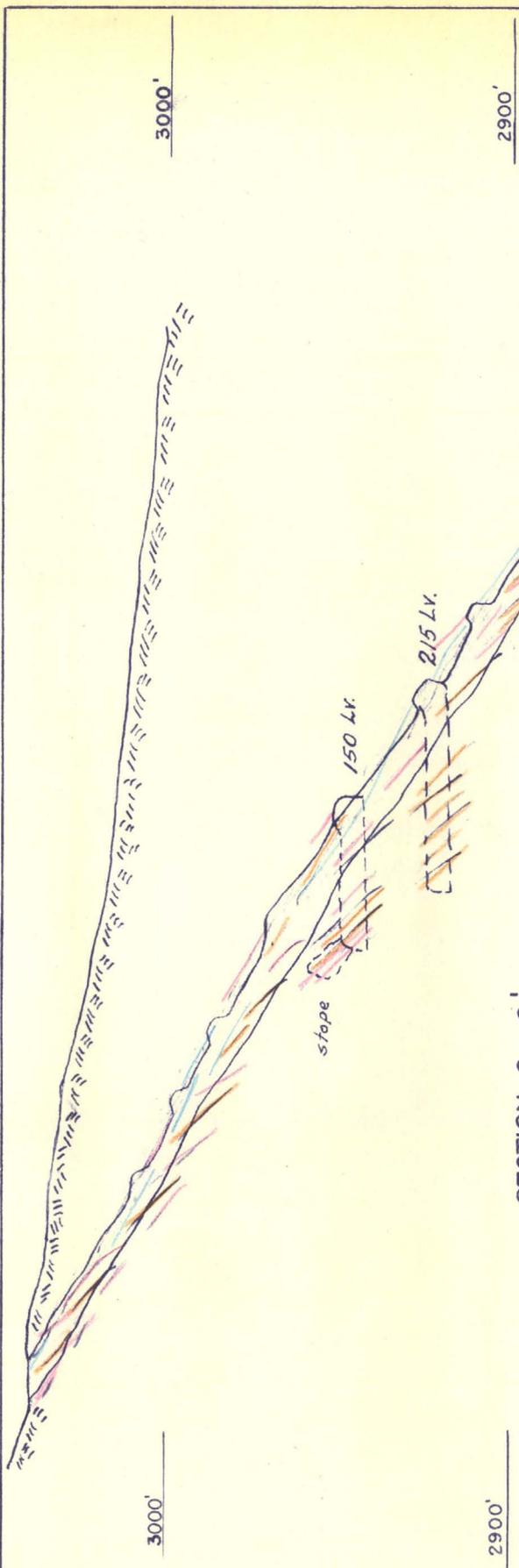


CENTROID CONSOLIDATED MINING CO.

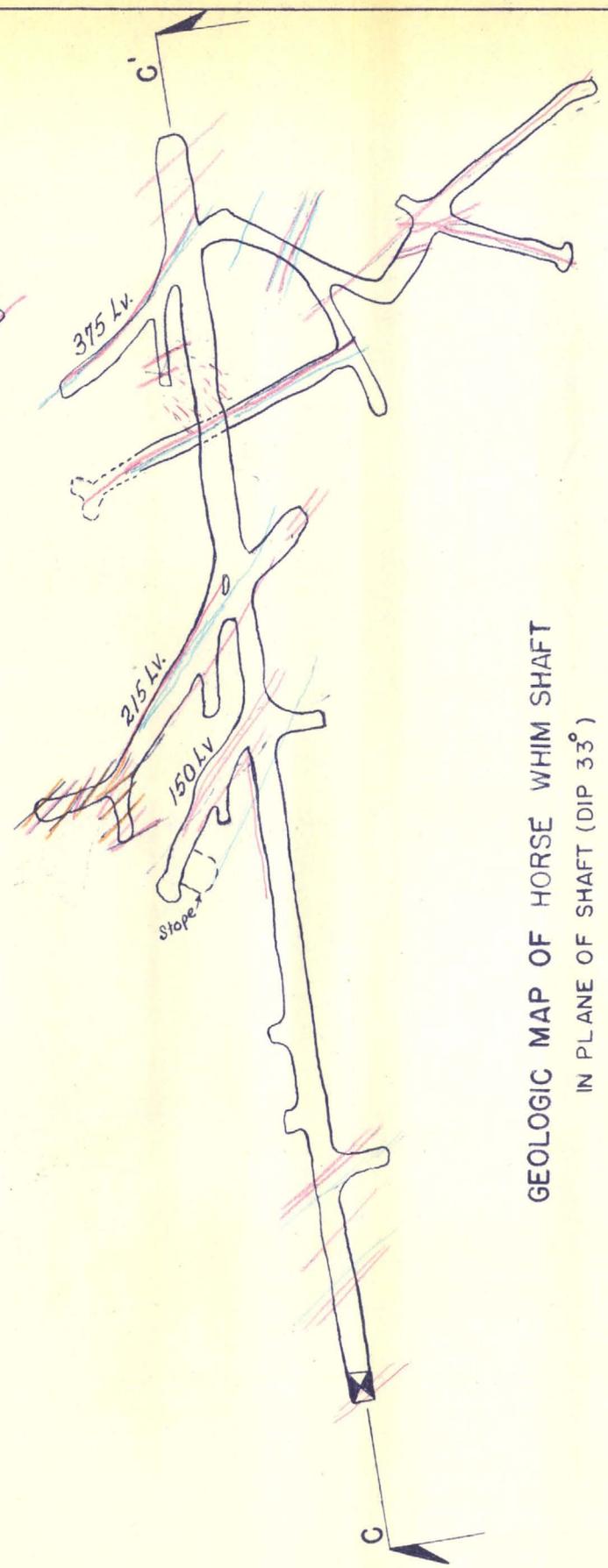
SECTION B-B'
 LOOKING EAST
 SCALE: 1"=100'

JULY 1957

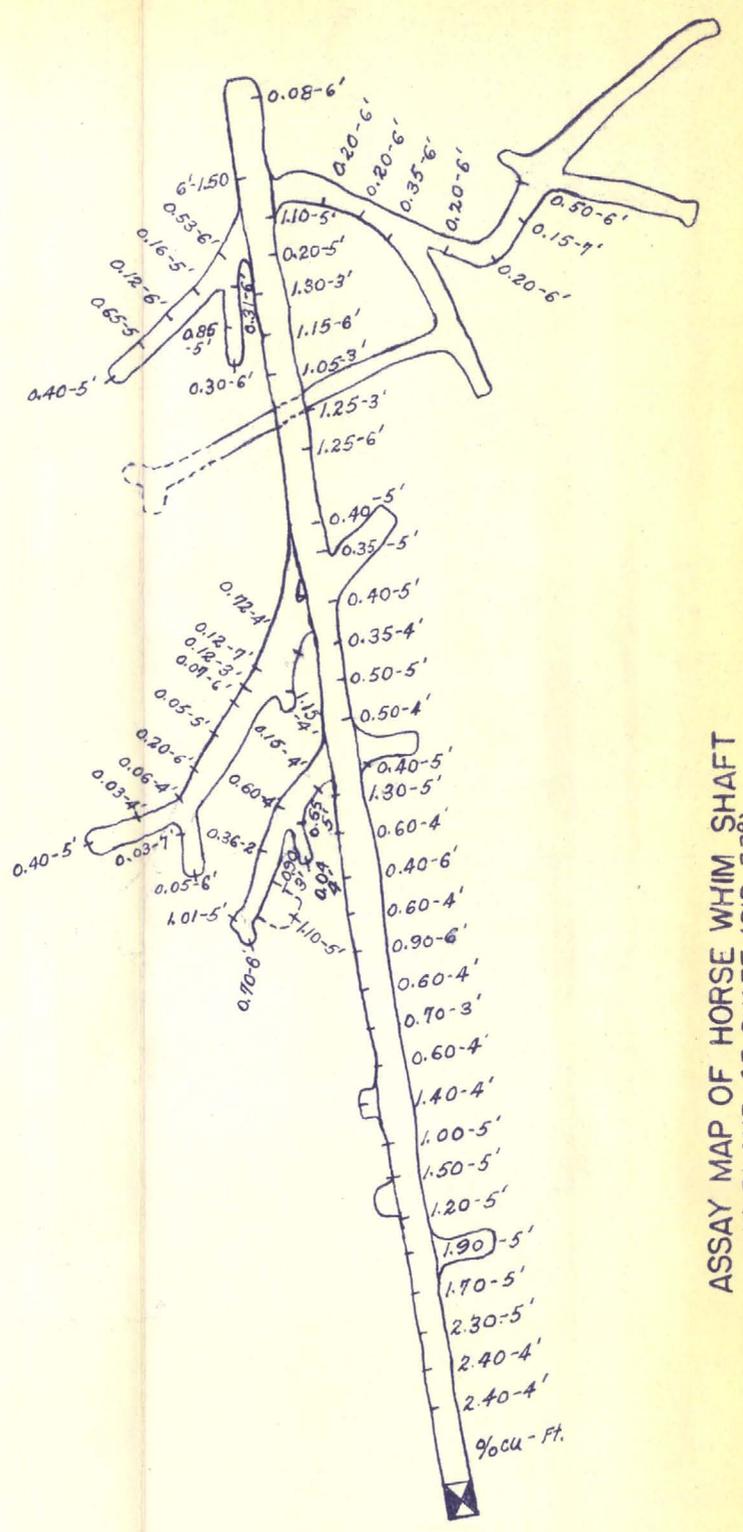
R.E.M.



SECTION C - C'



GEOLOGIC MAP OF HORSE WHIM SHAFT
IN PLANE OF SHAFT (DIP 33°)



ASSAY MAP OF HORSE WHIM SHAFT
IN PLANE OF SHAFT (DIP 33°)

CENTROID CONSOLIDATED MINING CO.
GEOLOGIC & ASSAY MAPS
OF
HORSE WHIM SHAFT

YUMA COUNTY, ARIZONA

SCALE: 1 IN. = 50 FT.

0' 50' 100'

JULY 1937 R. E. M.

COMPOSITE DIAMOND DRILL LOG

HOLE N° 2

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No. 5 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S 45° W. ANGLE: -85° ELEVATION: 2967 FT. T.D.: 366 FT. DATE STARTED: 5-24-54 DATE COMP: 6-4-54

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERAL-IZATION	ASSAYS %	
					SIZE	RUNS	REC%		Cu	
5		[Wavy pattern]	<i>Gneissic granite - strongly silicified, some veinlets blood red hematite along fractures.</i>	[Hole diagram]	NX	—	[Pink shaded core]	[Mineralization diagram]		
10										
15										
20										
25										
30										
35										
40										
45										
50										
55		[Wavy pattern]	<i>Pegmatite - high in feldspar strongly pegmatic.</i>	[Hole diagram]	BX	—	[Pink shaded core]	[Mineralization diagram]		
60										
65										
70										
75										
80										
85										
90										
95										
100										
105		[Wavy pattern]	<i>Diorite</i>	[Hole diagram]	[Pink shaded core]	[Mineralization diagram]	[Mineralization diagram]			
110										
115										
120										
125										
130										
135										
140										
145										
150										
155		[Wavy pattern]	<i>Pegmatite</i>	[Hole diagram]	[Pink shaded core]	[Mineralization diagram]	[Mineralization diagram]			
160										
165										
170										
175										
180										
185										
190										
195										
200										
205		[Wavy pattern]	<i>Gneissic granite</i>	[Hole diagram]	[Pink shaded core]	[Mineralization diagram]	[Mineralization diagram]			
210										
215										
220										
225										
230										
235										
240										
245										
250										
255		[Wavy pattern]	<i>Diorite</i> <i>Pegmatite</i> <i>Gneissic granite</i> <i>Diorite</i> <i>Gneissic granite - strong pegmatic</i> <i>Moderate chalcopyrite mineralization.</i>	[Hole diagram]	[Pink shaded core]	[Mineralization diagram]	[Mineralization diagram]			
260										
265										
270										
275										
280										
285										
290										
295										
300										
		[Wavy pattern]	<i>Pegmatite - strong blood red hematite stringers.</i> <i>Highly altered</i>	[Hole diagram]	[Pink shaded core]	[Mineralization diagram]	[Mineralization diagram]			

20%
 60%
 20%
 Cpy.
 CuOx
 FeOx
 0.30
 0.70
 0.10

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 3

COMPANY: Centroid Consolidated Mining Co. MINE: Centroid CLAIM: Jubilee No. 4 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. _____ E. W. _____
 BEARING: S. 69° W. ANGLE: -45° ELEVATION: 2950 FT. T.D.: 595 FT. DATE STARTED: 6-17-55 DATE COMP: 7-31-55

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERALIZATION	ASSAYS %	
					SIZE	RUNS	REC. %		Cu.	
5		(Pattern)	<i>Gneissic granite - slightly pegmatic</i>		AX					
10										
15										
20										
25										
30										
35				<i>Pegmatite</i>						
40				<i>Strongly pegmatic</i>						
45										
50										
55										
60										
65										
70	2900									
75										
80										
85										
90										
95										
100										
105										
110										
115			<i>Slightly pegmatic</i>							
120										
125										
130			<i>Strongly pegmatic</i>							
135			<i>Feldspathic</i>							
140			<i>Slightly pegmatic</i>		EX					
145										
150										
155										
160										
165										
170										
175										
180										
185										
190										
195										
200										
205										
210	2800		<i>Strongly pegmatic</i>							
215										
220										
225										
230										
235										
240										
245										
250										
255										
260										
265			<i>Moderate chalcopyrite 261 to 262'</i>							
270										
275										
280										
285										
290										
295										
300										

20
60
100
Cpy
Cu₂S
FeO_x

COMPOSITE DIAMOND DRILL LOG

HOLE N° 3 cont'd

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No4 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7N. RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 69°W ANGLE: -45° ELEVATION: 2950 FT. T.D.: 595 FT. DATE STARTED: 6-17-55 DATE COMP: 7-31-55

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: _____	CORE			MINERAL-IZATION	ASSAYS %	
					SIZE	RUNS	REC%		Cu	
5			<i>Gneissic granite - strongly pegmatic</i>							
10										
15										
20										
25										
30										
35										
40										
45										
50	2700									
55			<i>Veinlets blood red hematite, some chalcopyrite</i>							
60										
65			<i>Diorite with 1/2" seam of pegmatite.</i>							
70			<i>Hematite & chalcopyrite.</i>							
75										
80										
85										
90			<i>Strongly pegmatic</i>							
95										
100										
105										
110										
115										
120										
125										
130										
135										
140										
145										
150										
155										
160										
165										
170										
175										
180										
185										
190	2600		<i>Diorite with pegmatite dike</i>							
195										
200										
205										
210										
215										
220										
225			<i>Diorite with 1/2" pegmatite.</i>							
230										
235										
240			<i>Veinlets blood red hematite - some chalcopyrite.</i>							
245										
250										
255										
260										
265										
270										
275										
280										
285										
290										
295			<i>T.D.</i>							
300										

Ex

0.15

20
60
100
Cpy
CuO₂
FeO_x

COMPOSITE DIAMOND DRILL LOG

HOLE N° 4

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Black Hawk DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7N. RGE: 12W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S-23°W. ANGLE: -55° ELEVATION: 2972 FT. T.D.: 265 FT. DATE STARTED: 8-6-55 DATE COMP: 8-28-55

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERAL-IZATION	ASSAYS %	
					SIZE	RUNS	REC. %		Cu	
5			Overburden.							
10										
15										
20						20				
25			Gneiss - Fresh, good liniarity of micas.							
30										
35										
40						40				
45			Pegmatite? Quartz & feldspar							
50			Diorite - Schistic in character - weathered.							
55										
60						60				
65										
70										
75										
80						80				
85	2900		Diorite							
90										
95			mica looses liniarity below 96 ft.							
100						100				
105										
110										
115										
120			Diorite - gray - finegrained			120				
125			Gneiss - fresh - finer or closer mica banding.							
130										
135										
140										
145			Pegmatite - Quartz & feldspar, brown & yellow FeO _x , some cpy, py - some mica altered			140				
150			Diorite							
155			Gneiss - many bands quartz, feldspar (altered) little mica, occasional speck chalcopyrite, pyrite. Core badly broken, not fragmental.							
160						160				
165										
170										
175										
180						180				
185										
190										
195										
200						200				
205	2800		more mica 200-211 - liniarity very closely spaced.							
210										
215			Gneiss - very altered, bands of quartz & feldspars little mica, mostly as blotches. Possible target intersection below 210 ft.							
220						220				
225										
230										
235										
240						240				
245										
250										
255										
260						260				
265			T.D.							
270										
275										
280						280				
285										
290										
295										
300						300				

20
60
100
cpy
CuO_x
FeO_x

COMPOSITE DIAMOND DRILL LOG

HOLE N° 5

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Black Hawk No. 1 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. E.W.
 BEARING: S. 45° W. ANGLE: -45 ELEVATION: FT. T.D.: 216 FT. DATE STARTED: 8-28-55 DATE COMP: 9-9-55

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERALIZATION	ASSAYS %	
					SIZE	RUNS	REC. %		Cu	
5			<i>Gneiss - fine grained, thin seamed. Feldspar, slightly pegmatic to 80 ft. Yellow-brown iron stain to 80 ft. Gneiss character more pronounced below 80 ft.</i>	↑	↑	↑	↑	↑		
10										
15										
20										
25										
30										
35										
40										
45										
50										
55			<i>Overburden to 35 ft.</i>	↓	↓	↓	↓	↓		
60										
65										
70										
75										
80										
85										
90										
95										
100										
105			<i>Quartz, granular, some feldspars, micas fresh-sparse. Slightly altered. Gneissic texture almost destroyed.</i>	↓	↓	↓	↓	↓		
110										
115										
120										
125										
130										
135										
140										
145										
150										
155			<i>Possible intersection of target - a minor blood red fissure exposed on the surface in a small pit.</i>	↓	↓	↓	↓	↓		
160										
165										
170										
175										
180										
185										
190										
195										
200										
205			<i>T.D.</i>	↓	↓	↓	↓	↓		
210										
215										
220										
225										
230										
235										
240										
245										
250										
255										
260										
265										
270										
275										
280										
285										
290										
295										
300										

20
60
100
CPY
CuOx
FeOx

COMPOSITE DIAMOND DRILL LOG

HOLE N° 6

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Hancock No.3 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 60° W. ANGLE: -45° ELEVATION: 2935 FT. T.D.: 750 FT. DATE STARTED: 2-10-56 DATE COMP: 4-15-56

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - - -	CORE			MINERAL-IZATION	ASSAYS %	
					SIZE	RUNS	REC%		Cu	
5			<i>Gneissic granite, pegmatite at 42.9' to 49.2'</i>							
10										
15										
20										
25										
30										
35										
40										
45										
50	2900									
55										
60										
65										
70										
75										
80										
85										
90										
95										
100										
105										
110										
115										
120										
125										
130										
135										
140										
145										
150										
155										
160										
165										
170										
175										
180										
185										
190	2800									
195										
200		Pegmatite								
205										
210										
215										
220										
225										
230										
235		Pegmatite								
240										
245										
250										
255										
260										
265										
270										
275										
280		Pegmatite								
285										
290										
295										
300										

Bx

Ax

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

20

60

100

Apv

CuOx

FeOx

COMPOSITE DIAMOND DRILL LOG

HOLE N^o 6 cont'd-2

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Hancock No. 3 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 60° W ANGLE: -45° ELEVATION: 2935 FT. T.D.: 750 FT. DATE STARTED: 2-10-56 DATE COMP: 4-15-56

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: _____	CORE			MINERALIZATION	ASSAYS %		
					SIZE	RUNS	REC. %		Cu.		
5		[Diagrammatic rock texture]	<i>Gneissic granite - slightly pegmatic</i>								
10											
15											
20											
25											
30											
35											
40											
45	2700										
50											
55											
60											
65											
70											
75											
80											
85											
90											
95											
100		[Diagrammatic rock texture]	<i>Strongly pegmatic</i>								
105											
110											
115											
120											
125											
130											
135											
140											
145											
150											
155											
160											
165											
170	2600	[Diagrammatic rock texture]	<i>Pegmatite</i>								
175											
180											
185											
190											
195											
200											
205											
210											
215											
220											
225											
230											
235											
240											
245											
250											
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

20
60
100
Cpy
Cu Ox
Fe Ox

COMPOSITE DIAMOND DRILL LOG

HOLE N^o 6 cont'd-3

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Hancock No. 3 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 60° W. ANGLE: -45° ELEVATION: 2935 FT. T.D.: 750 FT. DATE STARTED: 2-10-56 DATE COMP: 4-15-56

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERAL-IZATION	ASSAYS %	
					SIZE	RUNS	REC%		Cu	
5			<i>Gneissic granite - slightly pegmatic</i>							
10	2500		<i>Strongly pegmatic</i>							
15			<i>Diorite</i>							
20										
25										
30										
35			<i>Diorite</i>							
40			<i>Few blood red veinlets hematite 633'-35'</i>							
45			<i>Slightly pegmatic (some chalcopyrite)</i>							
50										
55			<i>strongly pegmatic</i>							
60										
65										
70										
75										
80										
85										
90										
95										
100										
105										
110										
115			<i>Slightly pegmatic</i>							
120			<i>Few veinlets blood red hematite 722'</i>							
125										
130										
135										
140										
145										
150			<i>T.D.</i>							
155	2400									
160										
165										
170										
175										
180										
185										
190										
195										
200										
205										
210										
215										
220										
225										
230										
235										
240										
245										
250										
255										
260										
265										
270										
275										
280										
285										
290										
295										
300										

20
60
100

COMPOSITE DIAMOND DRILL LOG

HOLE No 7

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No. 2 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 82° W. ANGLE: -45° ELEVATION: 3041 FT. T.D.: 500 FT. DATE STARTED: 7-21-56 DATE COMP: 8-17-56

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: _____	CORE			MINERALIZATION	ASSAYS %									
					SIZE	RUNS	REC%		Cu									
5			<p><i>Gneissic granite, many small stringers & veinlets of blood red hematite - strongly pegmatic</i></p>															
10																		
15																		
20																		
25																		
30																		
35																		
40																		
45																		
50																		
55	3000																	
60																		
65																		
70																		
75																		
80																		
85																		
90																		
95																		
100																		
105																		
110																		
115																		
120																		
125																		
130																		
135																		
140																		
145																		
150																		
155																		
160																		
165																		
170																		
175																		
180																		
185																		
190																		
195	2900																	
200											<p><i>Gneissic Granite - slightly pegmatic, strong hematite at gradational change.</i></p>							
205																		
210																		
215																		
220																		
225																		
230																		
235																		
240																		
245																		
250											<p><i>Gneissic granite, strongly pegmatic.</i></p>							
255																		
260																		
265																		
270																		
275																		
280																		
285																		
290																		
295																		
300																		

20
60
100
CpY
CuOx
FeOx

COMPOSITE DIAMOND DRILL LOG

HOLE No 7 cont'd

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No. 2 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7N RGE: 12 W. SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 82° W. ANGLE: -45° ELEVATION: 3041 FT. T.D.: 500 FT. DATE STARTED: 7-21-56 DATE COMP: 8-17-56

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERAL- IZATION	ASSAYS %		
					SIZE	RUNS	REC%		Cu		
5			<i>Gneissic granite - strongly pegmatic</i>								
10											
15											
20											
25											
30											
35											
40	2800										
45											
50											
55											
60											
65											
70											
75											
80											
85											
90											
95											
100											
105											
110											
115											
120											
125											
130											
135											
140											
145											
150											
155											
160											
165											
170											
175											
180	2700										
185											
190											
195											
200					<i>Diorite, last 6" of hole. T.D.</i>						
205											
210											
215											
220											
225											
230											
235											
240											
245											
250											
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

20
60
/00

COMPOSITE DIAMOND DRILL LOG

HOLE N° 8

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No. 5 DISTRICT: Ellsworth
 COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. SEC: 18 N.S. E.W.
 BEARING: S. 45° W. ANGLE: -61° ELEVATION: 2976 FT. T.D.: 370 FT. DATE STARTED: 10-24-56 DATE COMP: 1-11-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - - -	CORE			MINERALIZATION	ASSAYS %	
					SIZE	RUNS	REC%		Cu	
5			<i>Gneissic granite</i>		Bx	—				
10						—				
15						—				
20			<i>Basalt, bands of pegmatite & gneissic granite.</i>			20				
25						—				
30						—				
35						—				
40						40				
45						—				
50						—				
55						—				
60						60				
65						—				
70						—				
75						—				
80						80				
85	2900					—				
90						—				
95						—				
100			<i>Gneissic granite - strongly pegmatic</i>			100				
105						—				
110						—				
115						—				
120						120				
125						—				
130						—				
135						—				
140						140				
145						—				
150						—				
155						—				
160						160				
165						—				
170						—				
175						—				
180						180				
185						—				
190						—				
195			<i>Pegmatite</i>			—				
200	2800					200				
205						—				
210						—				
215						—				
220						220				
225						—				
230						—				
235						—			0.10	
240						240			0.05	
245						—				
250						—				
255						—				
260						260				
265						—				
270						—				
275						—				
280						280				
285						—				
290						—				
295						—				
300						300				

Reamed BX

20
60
100
Cpx
CuOx
FeOx

COMPOSITE DIAMOND DRILL LOG

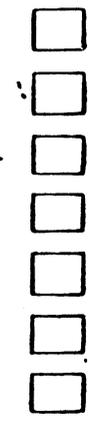
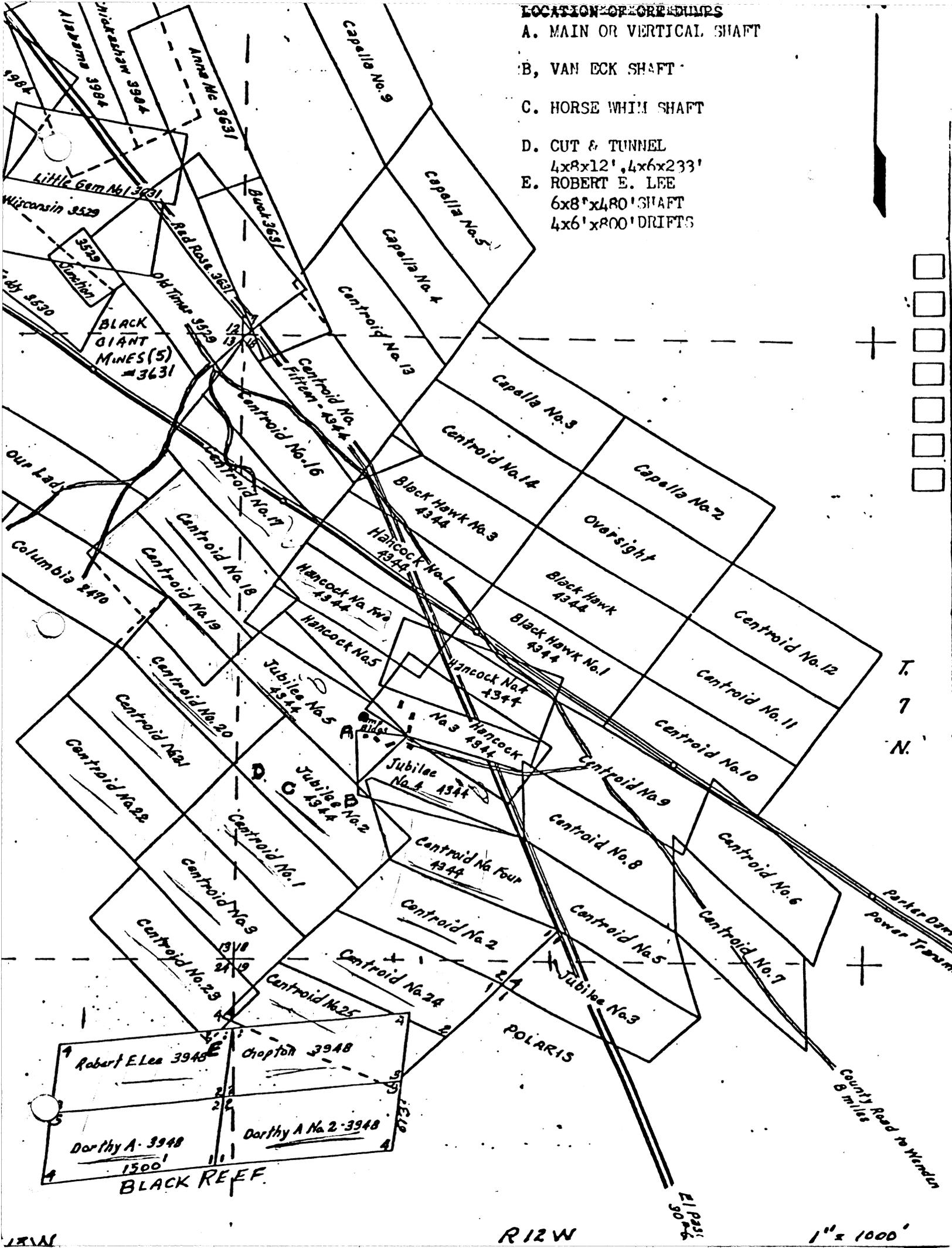
HOLE No 8 *cont'd*

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No. 5 DISTRICT: Elsworth
 COUNTY: Yuma STATE: Arizona TWS: 7N RGE: 12 W SEC: 18 N.S. _____ E.W. _____
 BEARING: S. 45° W. ANGLE: -61° ELEVATION: 2976 FT. T.D.: 370 FT. DATE STARTED: 10-24-56 DATE COMP: 1-11-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: _____ CASING: - -	CORE			MINERAL-IZATION	ASSAYS %		
					SIZE	RUNS	REC%		Cu		
305	2700		<i>Gneissic granite - strongly pegmatic</i>								
10											
15											
20											
325											
30											
35											
40											
45											
350											
55											
60											
65											
70											
375											
80											
85											
90											
95											
100											
105											
110											
115											
120											
125											
130											
135											
140											
145											
150											
155											
160											
165											
170											
175											
180											
185											
190											
195											
200											
205											
210											
215											
220											
225											
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235											
240											
245											
250											
255											
260											
265											
270											
275											
280											
285											
290											
295											
300											

20
60
100

- LOCATION OF ORE DUMPS**
- A. MAIN OR VERTICAL SHAFT
 - B. VAN ECK SHAFT
 - C. HORSE WHIM SHAFT
 - D. CUT & TUNNEL
4x8x12', 4x6x233'
 - E. ROBERT E. LEE
6x8'x480' SHAFT
4x6'x800' DRIFTS



T. 7 N.

County Road to Mendon
8 miles

Robert E. Lee 3948
Dorothy A. 3948
Dorothy A No 2 - 3948
Chopton 3948
BLACK REEF
1500'

R 12 W

1" = 1000'

Charles H. Dunning
Mining Engineer.

Route 1
Phoenix, Arizona

Centroid Consolidated Mines,
Wenden, Arizona.

Attention Mr W.B.Harris, President and General Mgr.

Gentlemen:

Pursuant to your request I have made an examination of your mining property near Wenden, and will submit herewith a report on the conditions as I have found them.

CLAIMS AND LOCATION:

The property examined consists of fifteen unpatented mining locations, a total of about 250 acres, located in Cunningham Pass, in the Ellsworth Mining District, Yuma County, Arizona. The names of the claims are the Jubilee numbers one to six, the Hancock numbers one to six, and the Black Hawk numbers one to three.

TITLE:

Title is by location and is vested in Centroid Consolidated Mines, a corporation organized under the laws of the State of Arizona. Surrounding the above group is the Centroid Group consisting of Centroid numbers one to twenty eight inclusive and I am advised that many of these claims have been transferred to the above named corporation.

GEOLOGY:

The general formation in the district and on the claims is a granite gneiss, probably of Pre - Cambrian Age. It might be explained that gneiss is a granitic rock that has been subjected to the metamorphic action of heat and pressure, after its original consolidation, resulting in a recrystallization of the original mineral constituents in a banded structure.

Following the period of heat and pressure, the cooling of the rock mass caused shrinking, bringing about the settling or subsidence of various areas. This settling took place in blocks of approximate rectangular shape and irregular size, with a main fault plane running north and south through Cunningham Pass, and minor fault planes, between the blocks, in a general east - west direction. Also the subsidence of these blocks on the west side of the main fault, settling downward along the fault under intense pressure, has caused fissures to be opened in these blocks, with a strike approximately parallel to the main fault and dipping at an angle of about 45 degrees toward it. Following this period of faulting, emanations from underlying magmas precipitated silica, iron, and economic minerals in the fault planes and fissures. Where conditions were sufficiently favorable, enough mineral was precipitated to form commercial ore.

The problem of the geologist is thus to locate those areas where a combination of favorable circumstances, each circumstance bringing some mineralization, has resulted in enrichments sufficiently great to form bodies of profitable ore. A vein may be strong and traceable on the surface or underground for miles, but will hardly ever, if ever, be found to be workable for any great length continuously.

The ore usually forms in shoots, and these shoots are enriched areas caused by a combination of circumstances. One circumstance is the vein itself. Other circumstances necessary to proper enrichment may be cross faults or cross veins, or a later or more extended period of movement in special areas. That is to say that the depositing of minerals is a very slow process and where a channel of mineralization is kept open or reopened by additional movement, the mineralizing action is prolonged, and the possibility of enrichment much greater.

This is all rather theoretical geology but applies to typically to the conditions at your property that it is well to have these basic principles in mind. At your property we have the main north and south fault through Cunningham Pass about a half mile east of your shaft. Then we have an east and west cross fault just south of your shaft, forming the boundary between two blocks. This fault has been filled with a diorite intrusion forced up from below, forming a diorite dike, and is now known as the diorite dike. The south cross cut from the 300 level of the shaft cuts this dike and proceeds considerably beyond it. There is a distinct difference in the characteristics of the formation on either side of this dike. Some mineralization accompanied this intrusion but the dike having filled the fault, the fault was no longer a special line of weakness and when further settling took place a new fault zone was opened, parallel to the dike and a short distance south of it. More mineralization accompanied the opening of this channel and this fault zone is known as the "October" vein.

The settling of this block, resisted by friction at its main line of movement, (the Cunningham Pass north - south fault) opened a series of rather flat fractures, striking north and south and dipping toward this fault. The upper one of this series, as far as observed, crops strongly on the surface, has been mined to some extent, and is called the "Horse Main Vein". A second member of the series is probably the vein on which most of the work was done at the bottom (299 ft.) of the old incline shaft. A third parallel vein shows still further east in a prospect hole and what would constitute a fourth vein, still further east, is being worked on one of the Guntroid claims about a half mile to the north.

As an illustration of how this series of veins was formed one can imagine a book held in a horizontal position with one end pressed tightly against a wall. With sufficient downward pressure on the end in contact with the wall, to force it downward along the wall, a series of rather flat openings would be formed between the leaves of the book.

All of these openings or veins have been mineralized. Not that their entire area is commercial ore, but shoots of commercial ore have been found, and will be found, along these veins.

The contact of these veins with the east - west fault known as the October vein makes especially good conditions for the formation of large and important ore bodies. However this fault zone is so crushed and open that it has become a channel for the downward movement of surface water which has leached out and carried downward much of the valuable minerals originally deposited in the vein material. These minerals will be redeposited at a lower depth, forming a secondarily enriched zone.

(3)

We therefore have three conditions, each bringing mineralization or enrichment; first the east - west fault zone, known as the "October" vein, which in itself was a mineralizing channel; second, the veins of the "Horse Whim" series, dipping rather flat to the east; and third, the secondary enrichment caused by the redeposition of minerals leached out by downward percolating surface waters. If development work can be projected to develop those areas where this triple condition is effective, important ore bodies should be opened up.

MINING FACILITIES:

Your property is unusually accessible and well located for convenience and economical mining. It is only nine miles over an excellent highway to the town of Wenden on the Santa Fe Railroad. Freight rates on ore and concentrates from Wenden to the various custom smelters are reasonable.

There is evidently sufficient water in some of the underground workings for all purposes, including a good sized mill. The inclined shaft makes about 1200 to 1500 gallons daily. The Black Reef shaft, 2500 feet to the north makes about 25,000 gallons daily. A fifty ton mill only requires about 10,000 gallons daily, if appliances are used to recover most of the water.

DEVELOPMENT:

The attached plan map shows the development to date. Your main shaft, 300 feet deep, has been well placed for permanent operations, being in the firmer country rock on the north side of the diorite dikes and "October" fault, but is rather far from important objectives for present economical development. A crosscut has been run at the 300 level for 650 feet to the south, cutting the diorite dikes at 200 feet, the "October" fault at 300 feet, and what appears to be the Horse Whim vein at 600 feet. A drift was run for 125 feet west on the "October" fault and then turned to the south - west as a cross cut. A drift and crosscut was also run for about fifty feet east along the "October" fault. In this east drift the mineralized condition is much improved and appears to be approaching an enriched condition.

The intersection of the Horse Whim vein and the "October" fault was cut in the "October" drift a short distance west of the main crosscut, but the condition there is so loose and so extensively leached, leached, that further depth would be required on that intersection to expect a consistent ore body.

The incline shaft, also known as the Van Bok working, was sunk many years ago, and no one now in the district is very familiar with just what was done. From the dumps it is evident that considerable ore of excellent grade was encountered. Old maps show an extensive working trending to the north, parallel to the Horse Whim vein, evidently following a parallel vein of that series. At the collar of the shaft there is a small vein striking east and west and it was naturally assumed that this was the vein on which the work was done. However this vein does not show on the surface for any appreciable distance and was never cut in the south crosscut from the main shaft. It is therefore evident that this apparent vein at the collar of the shaft is merely a short spur from one of the veins of the Horse Whim series, and the old map, showing the long working to the north west, parallel to the Horse Whim, and no working to the west, parallel to the little vein at the collar, bears out this theory.

(4)

This work is at the 259 level, as compared to the collar of the main shaft. Such a vein would not be cut with any of the present workings on your 300 foot level but might be cut very soon by an extension of the east crosscut on the "October" fault, and its presence there may be responsible for the enriched condition which this crosscut appears to be entering.

The Horse Whim shaft and tunnel is also old working from which considerable ore of excellent grade was mined. On the surface above the Horse Whim tunnel there is a large area of strong gozzen, which is an indication of intense mineralization, and the continuation of which, underground, has always been an objective. This gozzen area is important and is an excellent indication, but its shape and size and trend have not been fully understood. It is merely the cropping of the Horse Whim vein at an area on the hillside where the dip of the hillside is the same as the dip of the vein, and as the gozzen is somewhat harder than the country rock, a large area of it has remained plastered on the hillside. The area is in the vicinity of the contact between the "October" fault and the Horse Whim vein, and is an excellent indication of what may be expected when development on that contact reaches a zone below the effects of oxidation and leaching.

DEVELOPMENT ADVISED:

I would advise continuing the east crosscut along the "October" fault for 300 feet. This should cut the intersection between the "October" fault and the Van Eck vein, a very favorable objective, and the crosscut already appears to be entering an enriched zone. It is possible that the intersection on your present 300 level may be too leached to form consistent ore, as it was at the intersection of the "October" fault and Horse Whim vein but the present indications in the face of the crosscut are so favorable that the work should be done. Furthermore, much information would be gained that would serve as a more accurate guide for development at a deeper level.

I would advise the continuation of the south crosscut for at least 300 feet along the Horse Whim vein. The condition in the face of that tunnel is also good and an important ore shoot may be opened at any time along that vein. With the results of that work in hand a further program can be planned, and if further depth is necessary, a diamond drilling program might be most feasible. The facts that would be disclosed by the above plan of work would be a direct guide for the location of diamond drill holes.

CONCLUSIONS:

Your property has most excellent geological conditions for the formation of large and profitable ore bodies. The development already completed has made an excellent showing and tends to prove the theories which the surface conditions indicate.

Further development as outlined is well warranted and advised, and should be carried on step by step, each step serving as a guide for further work.

It is my opinion that further proper development will disclose ore bodies of a size and type that will be very profitable.

Respectfully submitted,

(s) Chas H. Dunning

Mining Engineer. Registered State of Arizona
Certificate No 295

THE DESERT MINE IN CUNNINGHAM PASS, ARIZONA.

Report by W. TOVOTE.

LOCATION:

The DESERT MINE is located just West of Cunningham Pass, a low saddle in the Harcuvar mountains, Yuma county, Arizona. The mine is on the south slope of the mountain range and the country descends from here on easy downward grade to Wenden on the Santa Fe railroad, Arizona & California branch, the nearest railroad point, which is approximately ten miles to the south.

The road, connecting the mine with Wenden, is in fairly good condition; only the short branch from the main Cunningham Pass road to the mine, about one quarter of a mile in length, is in need of repair. Four miles of the mainroad in immediate vicinity of Wenden are over sandy ground and liable to be cut up considerable during the dry season, the balance is on good gravel bottom.

The climate is typical desert climate, splendid winters and hot summers.

THE PROPERTY:

The property consists in eleven unpatented mining claims, owned by R. G. Robinson, Wenden, and held under option by D. W. Hall of Salome.

DEVELOPMENT:

Considerable development work has been done on the ground without leading to favorable result, but the work was not done with due regard to the geological features of the property or the district generally, and the outcome cannot be accepted as final as far as the possibilities of the mine are concerned.

The principal workings are:

Shaft No. 1. an incline 200 ft. deep, with short lateral cuts and about 50 ft of drifting on the bottom level.

Shaft No. 2. the main-shaft, and incline 325 ft. deep with over 500 ft. of laterals, most of these near the bottom of the shaft and at present under water.

Shaft No. 3. an incline about 70 ft. deep.

Shaft No. 1 and No. 2 are on the Copper Hill claim, shaft No 3 is on the Amanda claim, Besides these workings there are a great number of shallow shafts, tunnels and cuts.

EQUIPMENT:

The property is well equipped. It contains a camp on the Copper Hill claim, consisting of two corrugated iron buildings, the larger of which was designed as combination office bunk house warehouse; it is 100 ft. by 30 ft. and in good condition. The smaller could be utilized as a dwelling or bunkhouse.

At shaft No. 2 is a 25 HP Fairbanks-Morse gasoline hoist and a 9" by 8" Ingersoll Rand compressor, well housed in a corrugated iron building. The shaft has a good wooden headframe, the hoist about 400 ft. of $\frac{1}{2}$ " cable, several buckets and other accessories. A pump was on the bottom level at the time of my last visit to the mine, when the water had been taken out. It is supposed to be there still, but not in good condition. An air-receiver, five tanks piping, blacksmith outfit and other minor equipment are on hand.

At shaft No. 1 is a horse-whim.

The mine is therefore in excellent condition for immediate resumption of work. The flow of water is not heavy and can be easily handled by bailing.

GEOLOGY:

The Cunningham Pass district is an area of schist, invaded by large masses of granite-porphyry, which send out pegmatitic and aplitic dikes. Other intrusions are dikes of diabase or diorite, or both. Near Cunningham pass these dikes resemble diabase, but farther West they are decidedly diorite. Possibly there is a still later intrusion of a semibasic porphyry.

The veins of the district strike NW/SE and dip generally to the NE. Deviations to almost due North/South and East/West are found, but the most important ore shoots are found along veins of the intermediate directions, and N 65 W and N 30 W seem to be the most favored directions.

The mineralization is twofold and consists in copper and gold, both occur independently as well as jointly in the veins. The principal

gangue minerals are quartz, hematite and siderite. Gold seems to be more closely connected with the hematite and quartz, copper with the siderite, but both mineralizations blend into each other. Chloritization is the principal rock alteration along the veins.

Very high grade ore has been produced from the district, about 18% copper is perhaps the average of past shipments, more attention has been paid to the copper heretofore than to the gold, because it is more easily recognized and sorted, but I have the impression that many a workable gold vein has been overlooked and that the future will bring considerable research in this direction. Shipments of ore, assaying as high as \$100- in gold are on record, but exceptional. Past shipments average probably close to \$ 10- in gold, accessory with the copper, but as mentioned before, gold veins, irrespective of copper, need more careful investigation.

The vein-forming agencies are documented as follows:

1. Brecciation.

2. Introduction of the hematite, usually as cement in breccia veins, but also as massive bodies, veins and stringers.

The brecciation is probably due to the granite-porphry and pegmatite intrusion, the hematite pervades the pegmatite and is therefore later; it might be due to the diorite intrusion.

3. Introduction of siderite, chalcopyrite and pyrite.

4. Deposition of quartz, pyrite and chalcopyrite.

The copper deposition has very frequently followed the pre-existing hematite veins and these have been followed generally in prospecting. Quartz, pyrite, chalcopyrite veins have been prospected independently, but are most important, where they join the older hematite veins.

Oxidation and secondary enrichment have been very pronounced and most of the ore, mined hitherto, has come from horizons, affected by these agencies. Minerals of these horizons are: malachite, azurite, cuprite and chalcocite; but a good deal of straight chalcopyrite-pyrite ore has also been mined profitably, which could be considered strictly primary even if there is sometimes an indication that chalcopyrite also might locally be a product of secondary processes.

Successful mines have been the Bullard and the Critic, which started on very good ore bodies right from the grass roots down. Lately the Little Giant mine has shipped considerable ore of very good grade, found below very uninviting outcrops. A good many other properties and veins have produced occasional shipments, mostly from short and shallow surface ore bodies, mined by prospectors and leases, which abandoned the work, as soon as the visible ore was exhausted. The veins explored were usually tight stringer veins and the ore-shoots at their best short irregular lenses, which could be mined only because the ore was of very good grade and attractive self-fluxing quality. There was a number of very strong veins with big hematite-quartz croppings in the district, which appeal to me as decidedly worth testing, because they embody all the features of the proven veins and very frequently show copperstain and copper ore locally. It is peculiar, that practically no serious development work has been attempted on these veins up to now. Probably the most attractive of these is the Desert vein.

THE DESERT VEIN:

The Desert vein has a remarkable outcrop of hematite and quartz, surrounded by wide areas of crushed, chloritized porphyry. Copperstain is found as well in the hematite-quartz, as in the altered decomposed porphyry. The vein occurs at and near a schist/granite-porphyry contact and diorite dikes are intruded in the vein zone. The big outcrop is apparently due to the intersection of several veins. The entire width of the outcrop is locally up to 100 ft. and more on the surface, but the actual width of the vein is considerable less, because the flat dip of the vein gives an exaggerated impression. Still the vein is remarkably strong and wide and will probably average over 25 ft. in width over large sections. Besides the main vein there are several minor veins on the property, some of which disclose fair copper showings in superficial workings.

The intersection area, marked by the big outcrop, is on the side

of the hill, over 500 ft, NW from shaft No. 1 the nearest working of any moment. The intersection line should draw away from this shaft even farther in depth.

Shaft No 2 is about 500 ft. farther south, beyond, shaft No.1 and the workings from shaft No 2. in depth are about abreast of shaft No 1. It would require probably an additional 750 ft. of drifting from here, before the workings on this level would enter the favorable area, indicated by the big outcrop. The long draft from shaft No 2 shows a very strong and wide vein of altered crushed and partly chloritized porphyry impregnated with pyrite and chalcopyrite locally, and permeated by hematite in seams and flakes. Brecciation is very pronounced; one small shoot of good chalcopyrite ore with siderite and hematite was encountered, showing that copper mineralization is to be expected. While the vein explored is undoubtedly one of the veins, responsible for the big outcrop, it is only one of two or more, which produce this outcrop in their intersection zone. Beside this main intersection, the vein system of the Desert mine indicates several more favorable intersection points, none of which has been explored so far. Their exact location can only be approximately located, because the veins are largely buried under desert gravel, below shaft No 2.

As mentioned before, good copper showings are found in a number of places and the veins are in every way exactly like the others, which have been proven productive, but even more encouraging is the fact that one branch of the Desert vein can almost certainly be traced across the summit of the mountain into Bullard ground and is identical with the Bullard vein, which has a very good record of past production.

While copper ore might perhaps be limited to the vicinity of intersection points on this property, the possibilities of finding good ore along this vein appear as very good to me. If ore should be encountered along this vein, the chances are that it will be found in fairly large bodies, commensurate with the strength and size of the veins and since the general character of the Cunningham

Pass ore, is so very attractive, I consider the Desert a excellent prospect, which invites development work, to decide once and for all, whether there are possibilities in this district beyond the narrow stringer veins, hitherto exploited.

The ground in the old workings is soft and rather heavy, and the flooding will have caused considerable damage; therefore I would not advise, to utilize the old workings for further prospecting, but rather to abandon them altogether and prospect the property anew in immediate proximity of the big outcrop.

\$ 10 000- judiciously spent, should be sufficient to decide merits of the prospect and while this amount is an it seems to me well advisable on the strength of geological characteristics of the property, to risk development work.

Respectfully submitted .

(Signed) W. Tovote

January 7th 1919.

MEMORANDUM

TO

DATE

Feb 16, 1957

Phoenix Arizona

SUBJECT

Centroid Mine

Location Three miles north of Wenden Arizona, Cunningham Pass, in a restricted army range.

Owner G. H. Andrews, Wenden, 38 Claims?

History Continual fraud and corresponding lawsuits.

Geology Veins trending $315^{\circ}/35$ to 50° N.E. in a granite gneiss complex intersected by diorite dykes.

Production Copper ore shipped from Centroid #1 (formerly Coprite) out of pay streak 4" to 24" wide.

Workings Seven shafts 50 to 300' deep plus 1500 feet drifts, adits and cross cuts. In 300' level - 100' wide fault zone with gold bearing shalcopeyrite.

Assays Very low copper values, Ag 0.1 ozs, Au 0.09 ozs

Repts on file Ariz. Dept. natural resources - Phoenix

Last lawsuit in 1953

Water Domestic water hauled from Wenden

(NB - Literature search)

Phoenix - per bot

S P E C I A L

Field Engineers Report

Mine Critic (3 claims).

Date January 10, 1940.

District Ellsworth, Yuma Co.

Engineer Elgin B. Holt

Subject: SYNOPSIS REPORT

OWNER: Mrs. Rhoda Nolencheck & Co., Wenden, Arizona.

LOCATION: Property located in the Cunningham Pass area, Yuma County, about 12 miles north of Wenden, with which place it is connected by means of an excellent road, kept in repair by Yuma County.

METALS: Gold, silver and copper, gold predominating.

HISTORY: The Critic mine has been operated continuously by Mrs. Nolencheck since about 1917. Mrs. Nolencheck generally employs two or three miners and works in the mine herself, or sorts ore, runs hoists, etc. All ore produced is at present shipped to the Hayden Smelter for treatment. At the present time, I was informed by Mr. H. C. Reedall, the average grade of shipping ore is around \$50.00 per ton, in gold, silver and copper. Mr. Reedall also estimated total production of the Critic mine since 1917 at \$500,000; also that this property has been the main producer of gold, silver and copper ore in the Ellsworth District for the past twenty years.

VEINS: Two veins from 1 to 7 feet wide traverse property, striking from N.W. to S.E.; dip 80 deg. N.E. These veins are 75 feet apart on surface; but on the 410 ft. level of the mine the said veins are only 35 ft. apart. Deeper they will no doubt come together and possibly form a large ore shoot.

Dev. Main shaft 400 feet deep, with 3 levels, 100 feet apart.

Work:

ORE: Engineers estimate 40,000 tons of ore on dumps and in mine fills, with an average assay value of \$3.00 per ton in gold, silver and copper. Also an equal amount of ore blocked out in mine, with probable assay value of \$10.00 per ton in the said metals. Character of ore is chalcopryrite and chalcocite, so values can be recovered by flotation. Hence, total ore now available for milling would approximate 80,000 tons with a probable assay value gross of \$720,000.

Water: Water sufficient to supply a 100 ton mill could be secured from wells located 3 miles from property in Butler Valley, per Mr. Reedall.

Equipment: Mine equipped with one 15 and one 25 H.P. hoist and a Two-drill Compressor; also a 30-ton old style flotation plant; two boarding houses, store rooms and 3 or 4 dwelling houses. Elevation about 2,000 feet above sea level. Also, the newly constructed Parker-Phoenix power line crosses property.

This mine warrants investigation by any company looking for a property of merit; but inasmuch as it has been worked by owners who have been extracting shipping ore for a number of years, considerable money would have to be spent in new development work in order to open up new and important ore reserves.

ORE SHIPMENTS FROM CRITIC MINE.

Shipped to	Dry Tons	Oz Gold per ton	Total Oz Gold	%Copper per ton	Libs. Copper Total
Douglas	76.151	0.71	56.34	14.48	22.062
"	527.532	0.57	300.51	8.98	94.811
Humbolt	235.7245	1.04	245.55	17.81	84.441
"	10.595	2.20	2.33	9.82	.208
"	762.251	0.78	592.28	13.32	203.038
Hayden	73.922	0.67	49.44	11.96	18.884
"	47.765	0.47	22.72	6.30	6.016
"	25.4925	0.31	7.90	9.28	4.731
Wickenburg	13.4	1.90	25.46	13.20	3.538

1722.81

1302.53

105.15

EDWIN WALTER MILLS,
Consulting Mining Engineer.

Vicksburg, Arizona.
March 8, 1937.

W. B. Harris, Esq.,
General Manager,
Centroid Consolidated Mines,
Wenden, Arizona.

Dear Sir,-

During the past few weeks I have made a careful study and examination of your various groups of mining claims, namely,- JUBILEE, HANCOCK, CENTROID, BLACK HAWK and CUPRITE: all of these groups now comprise the Centroid Consolidated Mines.

I shall not go into any details regarding the LOCATION, ACCESSIBILITY, HISTORY, GEOLOGY, and DEVELOPMENT WORK, inasmuch as these subjects have already been described in great detail in the various mining reports, made of the entire area since May, 1930.

A considerable number of samples were taken under my direction during my examination, more especially in the workings and ore exposures on the JUBILEE, HANCOCK AND BLACK HAWK mining claims. The results of the assays of the gold-copper contents of these ore samples have been favorable throughout: in fact they strongly confirm the favorable impressions gained by me during the period of my examination.

I consider the geological conditions of your entire mining claims area to be very favorable and to warrant the conclusion that further prospecting and development work will surely lead to the discovery of large and profitable ore bodies.

I am also of the opinion that the indications found in the workings in the Horse Whim Shaft, and its immediate area,- the Hancock and Black Hawk mining claims, warrant further development work being undertaken as rapidly as possible as these areas show excellent possibilities for the development of ore bodies within a comparatively short time.

In addition, your transportation facilities and available water supply are unusually good for this desert country, and with the foregoing in mind, I herewith submit the following recommendations for your earnest consideration:

A.- The installation of a small pilot milling plant with a capacity of 25 tons of ore every 24 hours, for the treatment of ores from the Horse Whim Shaft and its immediate area. The milling plant should be placed in operation as soon as possible after preliminary ore tests are made to determine the proper flow sheet to be used. For this first unit your mining and milling costs should not exceed \$3.50 per ton which means that your total recovery of gold and copper will be more than sufficient to pay all development, mining and milling costs of the ore extracted from the Horse Whim Shaft and its immediate area.

B. The Horse Whim Shaft should be sunk the additional depth necessary to enable a drift and / or crosscut to be driven to connect with the 300 foot level of the vertical shaft; the use of this vertical shaft will expedite the hoisting of all the ore developed within this immediate area.

C. Prospecting and development work should be carried on at favorable points on the Hancock and Black Hawk mining claims, keeping in mind the rapid development of additional ore to warrant another 25 ton milling unit to be added to the pilot milling plant making a total capacity of 50 tons every 24 hours. Then as fast as the development of ore warrants doing so, the capacity of the milling plant should be increased correspondingly.

D. A geological map of your entire group of mining claims should be made as soon as possible; such a map will be of inestimable value in planning the future prospecting and development work.

E. As soon as your financial condition permits, a geophysical reconnaissance survey should be made also of the entire mining claims area. This will supplement the geological mapping and will be another definite aid to a thorough, systematic and scientific development of your mining property.

F. The data obtained from the geological mapping and the geophysical survey should indicate very definitely certain areas favorable for the discovery of profitable ore bodies. In order to prove the extent and value of these favorable areas within as short a time as possible, prospecting drills of the Bucyrus or Keystone type, can be used to advantage inasmuch as cores can be obtained of any ore found during drilling operations.

G. Your ore contains a high percentage of remarkably good iron, free from sulphur and phosphorous, in the form of specular hematite. It may be found possible to recover this iron as a commercial by-product. With this possibility in mind, it certainly will be worth while to have the necessary preliminary ore tests made to definitely determine whether or not this part of the project is commercially feasible. If it is at all feasible the additional revenue from the sale of this iron may be of considerable value.

3

H. In order to complete the installation of the 25 ton pilot milling plant, including power plant and the necessary mine equipment, it is estimated, that the total costs will range from \$18,000.00 to \$22,000.00

Trusting that the foregoing may be of some assistance to you in the proper development of your mining property, and with my firm conviction that you are on your way to develop a large and profitable mining property, I am,

Yours faithfully,

Edwin Walter Mills.

Edwin Walter Mills, E.M.

C O P Y

Silver Ozs.	Value.	Gold Ozs.	Value.	Copper %	Value.	Total Values. 1937	Total Values 1950
6666							
.4		.04	\$ 1.40	3.88	\$11.64	\$ 13.04	\$ 20.41
.6		.04	1.04	4.32	12.96	14.56	22.20
.1		.50	17.50	13.60	40.80	58.30	84.14
.1		.02	.70	.43	1.29	1.99	2.80
.1		.02	.70	.97	2.91	3.61	5.45
.1		.01	.35	trace		.35	.35
.4		.40	14.00	7.12	21.36	35.36	48.88
.2		.01	.35	trace		.35	.35
.1		.11	3.85	1.72	5.16	9.01	12.27
.2		.08	2.10	1.18	3.54	5.64	7.88
.2		.15	5.25	2.05	6.15	11.40	15.29
.2		.04	1.40	.75	2.25	3.65	5.07
.3		.12	4.20	5.82	17.48	21.68	32.71
.1		.09	3.15	1.51	4.53	7.68	10.54
.1		trace		.86	2.58	2.58	4.21
.4		.01	.35	2.80	8.40	8.75	14.07
.4		.06	2.10	34.88	104.64	106.74	173.01
.3		.02	.70	3.02	9.06	9.76	15.49
.7		.14	5.60	11.55	34.65	40.25	62.19
1.2		.09	3.15	7.66	22.98	26.03	40.68
.4		.05	1.75	1.29	3.87	5.62	8.04
.3		trace		.50	1.50	1.50	2.45
1.3		.03	1.05	.50	1.50	2.55	3.50

foregoing

The following list of samples were run under the direction of and obtained by EDWIN WALTER MILLS, consultant for Centroid Consolidated Mines. Area covered approximately 5000 feet in length by 3000 feet in width. Samples might be considered as a whole, as from the surface and were taken from ores in place and cropping with the idea of ascertaining if copper and gold might be found in the thoroughly leached surface, stringers and veins. While the surface appears encouraging it will be noted that both Tovote and Mills advise the development and treatment of the massive low grades.

A. E. PLACE
FOREIGN CLUB
CHIHUAHUA, MEXICO

5 CTS
CORREO
AEREO
MEXICO

Medusa

5 CTS



50 CTS
CORREO
AEREO



1880
48000000

The Virginias L. Harris.
1/2 Chestnut Lane. Minn.
P. O. Box 2236

Phoenix - Arizona

L. H. A.

Scoviato Aereo
Air Mail

COMPANIA MINERA ARADOS, S. A.

CALLE ALDAMA 112. ALTOS

APARTADO 3

CHIHUAHUA, CHIH., MEXICO

Virginia J Harris
P.O.Box 2236
Phoenix, Arizona c/o Centroid Cons. Mines

November 12, 1951

Dear Mrs. Harris:

I am delighted to hear that you have been equipping and working your mines near Wenden, Arizona, and I hope you will make a good producer of gold and silver-bearing copper ores out of them.

While it has been some time since I visited you there and inspected your mines I do remember that I was very favorably impressed with your property and that I recommended it to my employer, Mr. W.W. Hartman for development. I was at that time operating the Wall Street Mine for him in Nelson, Nevada. But Hartman had just taken over another proposition and did not care to assume at that time the reopening and development of your mines, especially as the shaft was not open for inspection at that time.

As far as visible I carefully looked over your various claims and I concluded that by rehabilitating your main shaft and driving levels out towards the veins that could be seen on the surface, you should cut some very interesting veins below, with good indications of ore at depth.

You now write me that you have followed out my suggestions and have cut into good ore below. That your shaft has been opened up to a depth of 250 feet and provided with a good sump and with ore chutes, in good shape for drifting both ways at the bottom level, where you are now working. That 125 feet out from the shaft you have run into copper carbonate ores assaying from 4% to 10% of copper. This proves that you are on the right track and will probably encounter rich secondary ores when you reach water at a lower level; and below that primary ores of copper with some gold and silver.

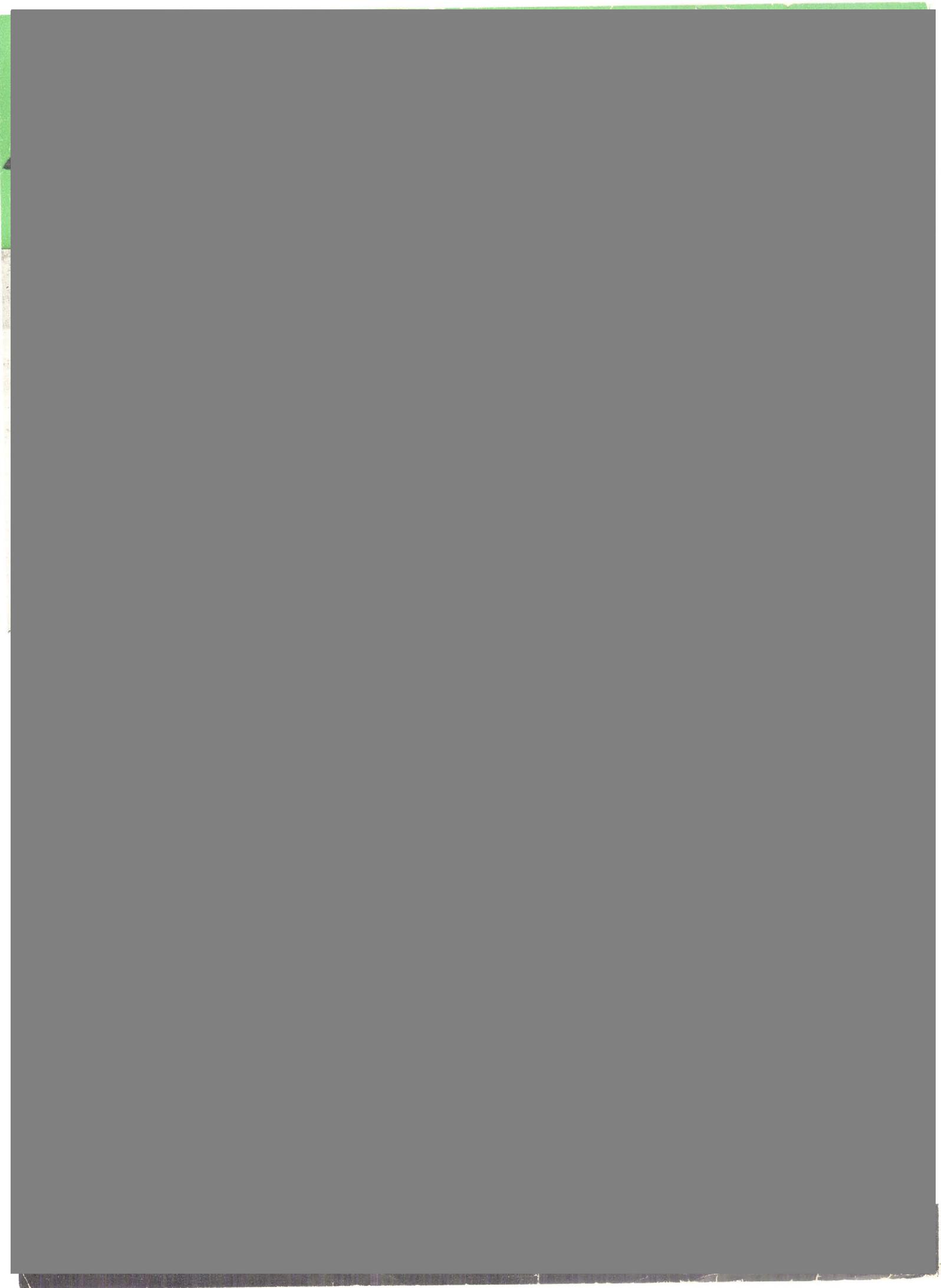
You also write that out on the 200 foot level, in the same direction you have cut some oxidized copper ore that assays 32% in copper, and with the gold and silver components assays \$195.00 per ton. That is splendid. You should find more of that further down. I am sure that your real mine will be found several hundred feet below the upper oxidized zone, and no one can tell much about that until that zone is reached by shaft or by diamond drilling.

Your present showings certainly warrant your seeking more capital for continuing downwards. Especially so in view of the present price and need of copper, and of the very favorable economic advantages your property offers. Good flat roads, a short distance from the main paved highway between Phoenix and Los Angeles, power and gas lines right at the property, a nice camp, telephone, and only a short downhill haul to the railroad and highway at Wenden. Three smelters within reach, at Hayden, Miami and Superior. What more would you want?

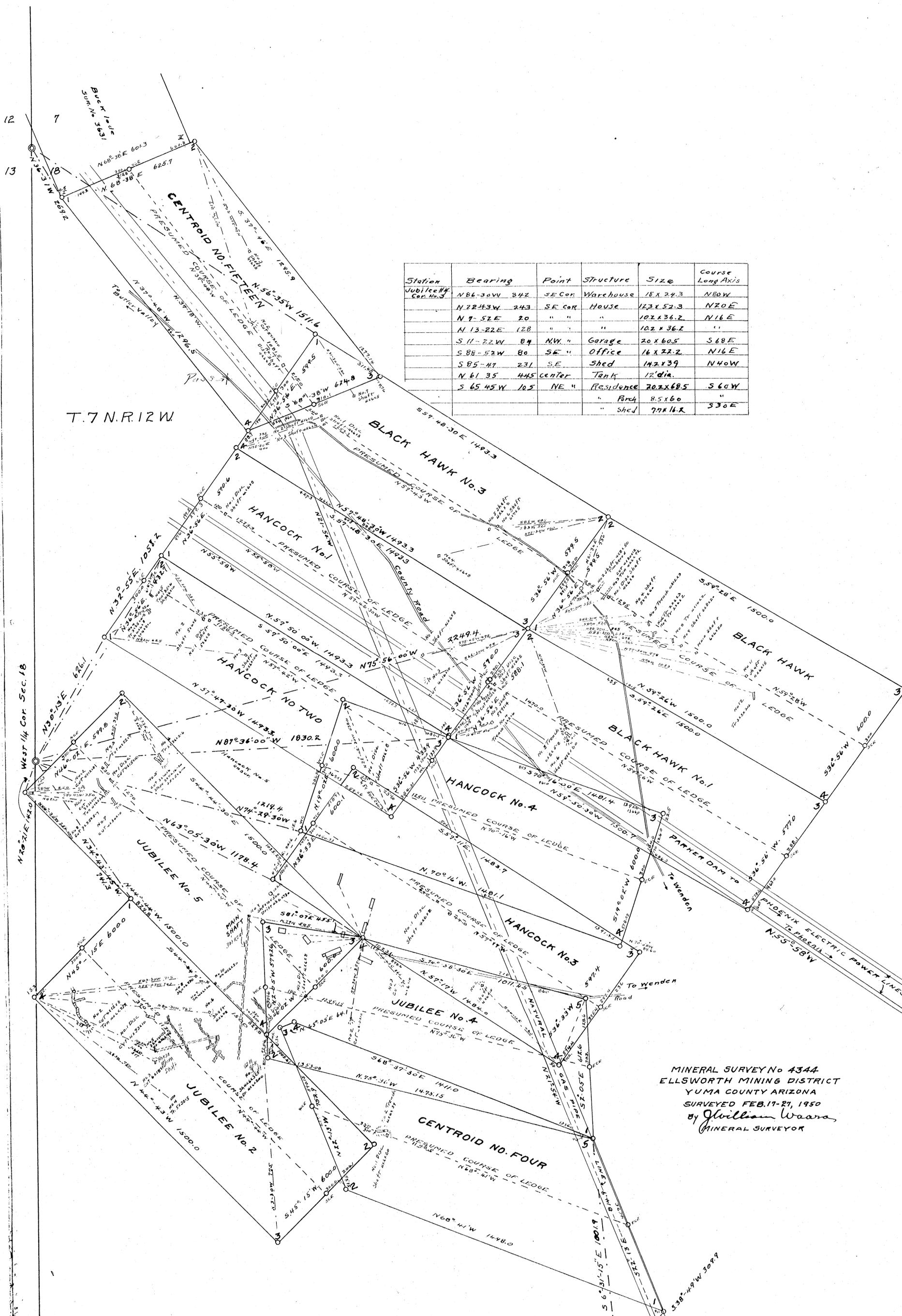
With copper at 27 cents a pound, with additional gold and silver to help pay costs you should have no trouble in getting financial help for your enterprise. If necessary you can refer to me. I will stand back of my original judgment that your Centroid Mines have a very good chance of making a valuable copper producer.

Sincerely yours


A. E. Place
Engineer of Mines



Station	Bearing	Point	Structure	Size	Course Long Axis
Jubilee #4 Cor. No. 3	N 86° 30' W 242	SE Cor.	Warehouse	18 x 24.3	N 80° W
	N 22° 43' W 243	SE Cor.	House	12 x 52.3	N 20° E
	N 7° 52' E 20	" "	"	102 x 36.2	N 16° E
	N 13° 22' E 128	" "	"	102 x 36.2	"
	S 11° 22' W 84	NW "	Garage	20 x 60.5	S 68° E
	S 88° 52' W 80	SE "	Office	16 x 22.2	N 16° E
	S 85° 47'	231	Shed	14.2 x 39	N 40° W
	N 61° 35'	445 center	Tank	12' dia.	"
	S 65° 45' W 105	NE "	Residence	20.2 x 68.5	S 60° W
			"	8.5 x 60	"
			"	7.7 x 16.2	S 30° E



MINERAL SURVEY No 4344
 ELLSWORTH MINING DISTRICT
 YUMA COUNTY ARIZONA
 SURVEYED FEB. 17-27, 1950
 by *William Waars*
 MINERAL SURVEYOR

To South 1/4 Cor. Sec. 18

R.BURTON ROSE, M.A.
Mining Geologist
San Jose, California

A L L I E D
G E O P H Y S I C S

April 8, 1952

Centroid Consolidated Mines
P.O. Box 2236
Phoenix, Arizona

Attention: Mr. William B. Harris

Gentlemen:

It is a pleasure to have recently examined your mine holdings in Cunningham Pass, Yuma County, Arizona; especially since they indicate favorable geologic structure and associated copper ore deposition, coupled with a sound ownership background.

As an overall resume we would like to make the following recommendations:

- 1.) Rehabilitate the 300 foot main vertical shaft and its 600-ft. south crosscut located on the Jubilee #5 Claim; since surface examination indicates relatively little re-timbering (collar not caved) and only a few feet of water.
- 2.) Following the above step, a raise connection to the bottom of the Horse Whim incline located on the Jubilee #2 Claim should be surveyed. A raise for the exploration of this ground area and connection with subsequent dual surface access will be much less costly than continued incline shaft sinking.
- 3.) Primary development objective on the south crosscut 300-ft. level should be the running of an east drift on the south side of the October fault-vein to cut the Van Eck vein. Drifting in both directions is then suggested in order to develop ore reported at the bottom of the Van Eck incline and to disclose the structural relationship of this vein with the October fault-vein and the diorite dyke 100 feet north.
- 4.) Further sinking of the Bob shaft located on the Centroid #4 Claim is important. This zone is particularly promising as seen in the surface trenching and at the collar of the prospect incline. No connection underground to the 300 foot level crosscut is warranted because of the separation distance.

5.) A diamond drill hole should be run from the bottom of the main 300 foot vertical shaft south parallel with the existing crosscut and at a downward angle of 45° in order to penetrate the October fault-vein at approximately 600-ft. below the surface; thus doubling the known vertical section. Ore content, leaching action and secondary enrichment factors can then be studied as guides in deeper shaft sinking plans.

Results of these steps will form the basis of future mill installation planning; an essential phase not practical to consider in detail at this time.

From a mine safety viewpoint the present hoist plant should be retained at the collar of the Horse Whim incline; although contemplated mining operations will be conducted through the main vertical shaft and hoist when installed.

Dewatering of the Black Reef incline on the Robert E. Lee Claim should be left until all the above steps have been completed and a mill is under construction. At such a time the pump installations with a connecting pipeline will be needed for milling operations, thus reducing out of pocket costs.

Trespass damage by the dual electric power lines would best be resolved on the basis of the most advantageous substation and permanent rate schedule possible.

It is believed that this program will disclose and develop ample copper ore tonnage to warrant a rather large mill unit. Because of freight and recovery charges, smelter shipment is not recommended; other than desired 50-ton car lots from each of the separate deposits for volume sampling purposes.

Geologic and mineralogic indications show marked leaching effect and the probability of appreciable deeper secondary enrichment. Several earlier mine reports and a very recent complete claims survey map provide record details.

Respectfully submitted,

Edwin W. Mills, E.M.

R. Burton Rose, M.A.

DIGEST OF MINING PROPERTY

EXPLORATION DEPARTMENT

NAME *Centrod Mines (Centrod-Capella Group)*

LOCATION *Elsworth Mining District, Graham County, Arizona
N12-13W, T7N 10 miles north of Guadalupe, Cunningham Pass.*

PRESENTED BY

OWNERS

REPORTS SUBMITTED *W. E. KARTCHNER, 1953, GEOLOGIST; F. H. HOIT, Field
Eng. 1940*

CLAIMS

HISTORY *Several old shafts and surface cuts. Some are stopped.
Operating history has centered about various lawsuits and
stock frauds.*

MINING FACILITIES *Horse Run incline shaft, Bob shaft, Black Reef incline shaft.*

GEOLOGY *Granite porphyry and schists cut by diabase
dykes. The diabase dykes contain barite and hematite
veins along with some copper staining. According to Dunning
mineralization is along flat lying fractures, striking N-S
Copper minerals are chalcocite and copper oxides occurring
along veins trending 315°/35° to 50° NE*

SAMPLING

ORE RESERVES

DEVELOPMENT

EQUIPMENT

ECONOMICS

Water must be hauled from Weeden.

TERMS

COMMENTS -

Requires a surface examination

EDWIN WALTER MILLS
Consulting Mining Engineer

Salome, Arizona,
P. O. Box 637,
October 14, 1951.

Mr. W. B. Harris, General Manager,
Centroid Consolidated Mines,
P. O. Box 2236,
Phoenix, Arizona.

Dear Mr. Harris:

This is another letter-report to you concerning my visit yesterday to the Number One Shaft workings of the Centroid Consolidated Mines. My visit underground with the Mine Foreman was of considerable interest to me, as certain indications on the work done since my last visit indicated that further sinking of the shaft and some additional work on the drift and crosscut on the 250-foot level will expose some ore.

I also recommend that the shaft be sunk an additional 30 or 35 feet and at the bottom of this sinking a crosscut should be driven in a northwesterly direction to see if it will expose any ore within a short distance from the shaft. The outlook is favorable.

On the 250-foot level at a distance of 85' from the shaft the drift which has just been started should be pushed ahead in a northwesterly direction as rapidly as possible with the expectation of striking ore within a reasonable distance. Work should also be continued on the short crosscut on this same level at a distance about 25 feet in from the shaft. The indications all point to good ore being found within the next 20 to 25 feet of crosscut work.

From now on I shall be glad to arrange to make visits to the mine every two weeks and to render letter-reports of my observations of the mining work that has been done during these periods. From my observations thus far it appears definitely that a good showing of commercial copper ore will be shown within a reasonable period from this date. And I shall be only too glad to cooperate in every possible way to attain this condition.

This examination confirms all of my opinions as stated in my mining report of my mine examination made in the month of March, 1937. I consider that the geological, mineralogical and topographical conditions are all strongly indicative of the presence of large and profitable orebodies which certainly warrant thorough exploration work in the full sense of the word.

As a result of my examinations during the past month I wish to strongly recommend that a complete geophysical survey be made of the immediate area that is being developed at this time, and also of the northerly flank of the mountain to the northward of this said area. I believe that this geophysical survey can be made at a reasonable cost by R. Burton Rose, M. A., of the Allied Geophysics, San Jose, Calif., who has an excellent reputation in mining circles for the fine work done by him. There is no doubt in my mind that the results shown by this geophysical survey would warrant immediate action in preparing a program for further examination by means of diamond-drilling. I have every reason to believe most sincerely that the results obtained from the operation of this program would prove definitely that the Central Centroid Mines would become one of the largest mining operations in the State of Arizona.

Yours faithfully,

Edwin Walter Mills
Edwin Walter Mills, E. M.



Richard E. Mieritz
MINING CONSULTANT

December 26, 1956

Mr. Manning W. Cox
222 A Oak Court
Palo Alto, California

Dear Bill:

Sure hope you will pardon my tardiness in forwarding to you the information on the Centroid Consolidated mining property. The near holidays and pressure for a report prevented my sending earlier.

For your convenience I am enclosing several reports and a map, all of which I know do not constitute adequate equipment and material to work with to form an opinion of the property but it may serve to give you a moderate idea as to whether you may have an interest in the area. For the present, this is all we have.

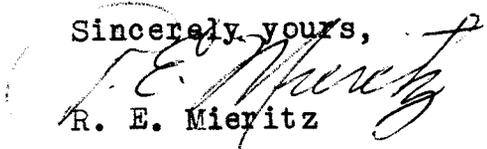
The contents of this envelope are as follows:
1-Wayne E. Kartchner Report
2-W. Tovote Report
3A. E. Place Letter to Virginia Harris
4-Charles H. Dunning Report
5-Edwin W. Mills letter to W. B. Harris-3/8/37
6- " " " " " " 10/14/51
7-R. Burton Rose letter to Centroid, 4/8/52
8-Dept of Mineral Resources Report-1/10/40
9-Claim Map, J. W. Wears, Mineral Surveyor, 1950

You will recall I mentioned we had sampled to same extent the Horse Whim Shaft from the collar down. As a matter of interest, the following weighted averages were obtained. Collar to -90 ft. @ 1.79%cu, -90 to -250 ft. @ 0.58%cu, -250 to -340 ft. @ 1.10%cu. The overall average being 1.05 % cu from the collar to 340 ft. The copper assay is that of total copper only. Several composites will be made to determine the oxide copper.

When you have arrived at a positive or negative decision of interest, we would appreciate if you return the enclosed information to us, that Centroid Consolidated Mining Co. 650 No. 1st Ave., Phoenix.

Sure wish you and the family had a very nice Christmas and will enjoy a good New Year.

Sincerely yours,


R. E. Mieritz

CC. Centroid Cons.

CENTROID CONSOLIDATED MINES
650 N. 1st AVENUE
PHOENIX, ARIZONA

WAYNE E. KARTCHNER, Ph.D. GEOLOGIST
REPORT

OFFICE

R. BURTON ROSE, B.A.

Mining Geologist

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San Jose, California

CENTROID CONSOLIDATED MINES

(Centroid-Capella Group)

Ellsworth Mining District

Yuma County, Arizona

1953

CENTROID CONSOLIDATED MINES

(Centroid-Capella Group)
Ellsworth Mining District
Yuma County, Arizona

Problem: Basic delineation of the geology and structure of a contiguous group of copper ore mining claims as shown on the accompanying map plate.

Location: The claims belonging to the Centroid Consolidated Mines covered by this report are located on both slopes of Cunningham Pass, a low saddle crossing the Marcuvar Mountains to Butler Valley. The claims lie in the Ellsworth Mining District, Northern Yuma County, Arizona, R. 12-13 W., T 7 N., Gila and Salt River Base Meridian. The pass is located about ten miles north of the town of Wenden. It is reached by a well graded dirt road. Elevations vary from 2400 to 3000 feet. Claim titles are held under federal filing rights and are on record.

Drainage: General drainage of most of the area is south through joining washes which are dry most of the year. Exceptionally they may overflow their banks as a result of sudden and heavy summer rains. A minor portion of the area drains northward into Butler Valley through similar dry washes. Domestic water is scarce and insufficient without hauling. Water for other purposes occurs in abundance in two deeper shafts in the immediate district.

Climate and Vegetation: This part of Arizona is typical desert, very hot in the summer and cold in the winter; receiving most of the yearly precipitation in the summer in thunder storms. Snow is not common. Desert vegetation grows well and includes the following typical plant types - Palo Verde, Saguaro (Giant Cactus), Cholla, Creosote Bush, Agave and Barrel Cactus.

Geology and Mineralizations: The most common rocks of this area are a coarse pegmatite granite and granite porphyry, in all stages of metamorphism; so that some has nearly lost all resemblance to an igneous rock and has become very schistose. The transition from coarse granite pegmatite to schist is gradual with few sharp boundaries between them. Rock removed from the main shaft is an augen gneiss showing the large feldspar phenocrysts drawn out into eyes, the dark minerals assuming parallel banding. Thin sections of this gneiss show a mineral composition typical of a granite, or possibly a syenite porphyry. The feldspars show some decomposition to kaolinite and some of the dark minerals have been epidotized. Otherwise, there is little evidence of alteration by mineralizing solutions.

These alterations indicate the granite porphyry is an old intrusive body; with no evidence that mineralization accompanied the intrusion. No contact was found showing the relationship of this intrusive with the invaded rock. The metamorphism that followed was probably caused by mountain building activities, resulting in great differences of metamorphic intensities.

Some rocks show little change while others have been very completely altered. Following this metamorphism, renewed igneous activity resulted in placement of numerous diabase dikes. These show no metamorphism, indicating a later period of intrusion the alteration of the coarse granite porphyry.

These diabase dikes vary in size from small bodies not over six inches in thickness to bold dikes one hundred feet across. They weather readily to a dark colored soil. As a result the dikes may be traced by the color of the weathered material. Some of these can be seen for as much as a mile away. Thin sections were made of this diabase. These show plagioclase feldspar making up about 50% of the rock, with hornblende and chlorite as an alteration product comprising about 40%, and pyrite and its alteration products accounting for about 5%. Inclusions within the diabase carry calcite and orthoclase. These inclusions may indicate the dikes have cut across limestone areas, but no limestone was found in the claims studied.

Most of the diabase dikes show some mineralization, mostly in the form of hematite veins and barite veins. Copper stains are rather persistent though not in abundance in any exposure studied. Hematite veins are in abundance in most areas, usually associated with the diabase dikes although sometimes not in immediate contact. However, they are always close enough to remove any doubt as to the genetic relationship. The barite veins usually form the central part of the hematite veins. Some copper carbonate is occasionally found in the barite.

Mineral Sections - Polished Surfaces: Samples of ores from the Horse Whim incline shaft were polished and studied by reflected light, showing the relationship of the minerals. Some quartz crystals, well formed, have filled openings later used by mineralizing solutions. These later solutions brought in chalcopyrite. While colors of the ore in its natural state often look like bornite, polished surfaces disclose no bornite; the colors being oxidation products. Hematite and siderite are intimately associated with the chalcopyrite, indicating deposition by the same processes. Presence of the siderite suggests the present topographic surface is approximately at the upper horizon of copper mineralization and deposition.

Small stringers of chalcocite were seen cutting into the chalcopyrite, giving evidence of secondary sulfide enrichment even at the shallow depth of the Horse Whim shaft. This feature gives promise of more enrichment in deeper zones.

Favorable mineralization zones - Recommended exploration:

I. The incline prospect shaft on Centroid No. Four and the trench adjacent to it show strong mineralization in line with many other mineralized and diabase outcrops; including old workings on Centroid No. 17. This would justify geophysical exploration and some diamond drilling. The first drill hole should be placed about 300 feet to the north-east of the outcrop and directed towards the south-west at an angle of 45° - 60° .

II. The above mineralized zone has a strike which intersects

the mineralized diabase dike, (October Vein), on Jubilee No. 2. near the center of the south-east end line for Jubilee No. 5. Where these zones intersect would seem to be worth diamond drill exploration. Due to the lack of guiding outcrops in this alluvial covered area it is difficult to place the drill hole precisely.

III. Near the corner of Hancock No. 2. and Centroid 17 and 18 many favorable geologic features are found. These include a wide iron vein, a diabase dike and interesting copper stains. This is along the same directional zone as old mine workings over the ridge on Centroid No. 17. This general area should be investigated by geophysical mapping and/or diamond drilling to see what depth can show. A diamond drill hole should begin near the center line of Hancock No. 2. and about 100 feet from the north-west end line; being drilled S.45°W. at an angle of about 45°-60°.

IV. Casella Group - Centroid No. 15., Black Hawk No. 3., Black Hawk and Oversight claims. Since repeated evidence points to mineralization associated with diabase dikes; this zone holds special promise. The strong dike structure here coupled with good showings of minerals (copper) along the prospect holes extending the length of the Black Hawk claim would look promising and should be investigated. Vein dip into the hill makes the placement of a diamond drill hole difficult. The most practical site is probably near the east side line of the Black Hawk claim about 500 feet south-east from the N.E. corner. The drill hole should be pointed towards the south-west at about a 60° angle.

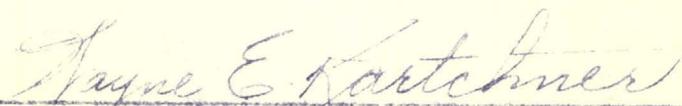
V. Several quartz outcrops occur on the Hancock No. 1. and Black Hawk No. 1. claims, closely associated with a rather definite shear zone. While the quartz is believed to be earlier in age than the district's copper mineralization, they should be thoroughly sampled. A diamond drill hole through the shear zone at this point has been previously recommended.

CONCLUSIONS

A number of favorable structural conditions occur over the property; together with appreciable copper mineralization and some secondary chalcocite enrichment at shallow depth. These conditions suggest a probable deeper secondary enrichment zone. Geophysical mapping and associated diamond drilling of surface indicated mineralization zones should provide effective location and determination of the surmised deeper copper deposition.

* * * * *

Respectfully submitted,


Wayne E. Kartchner, Ph.D., Geologist


E. Burton Rose, M.A., Mining Geologist

Dated: June 15, 1953.

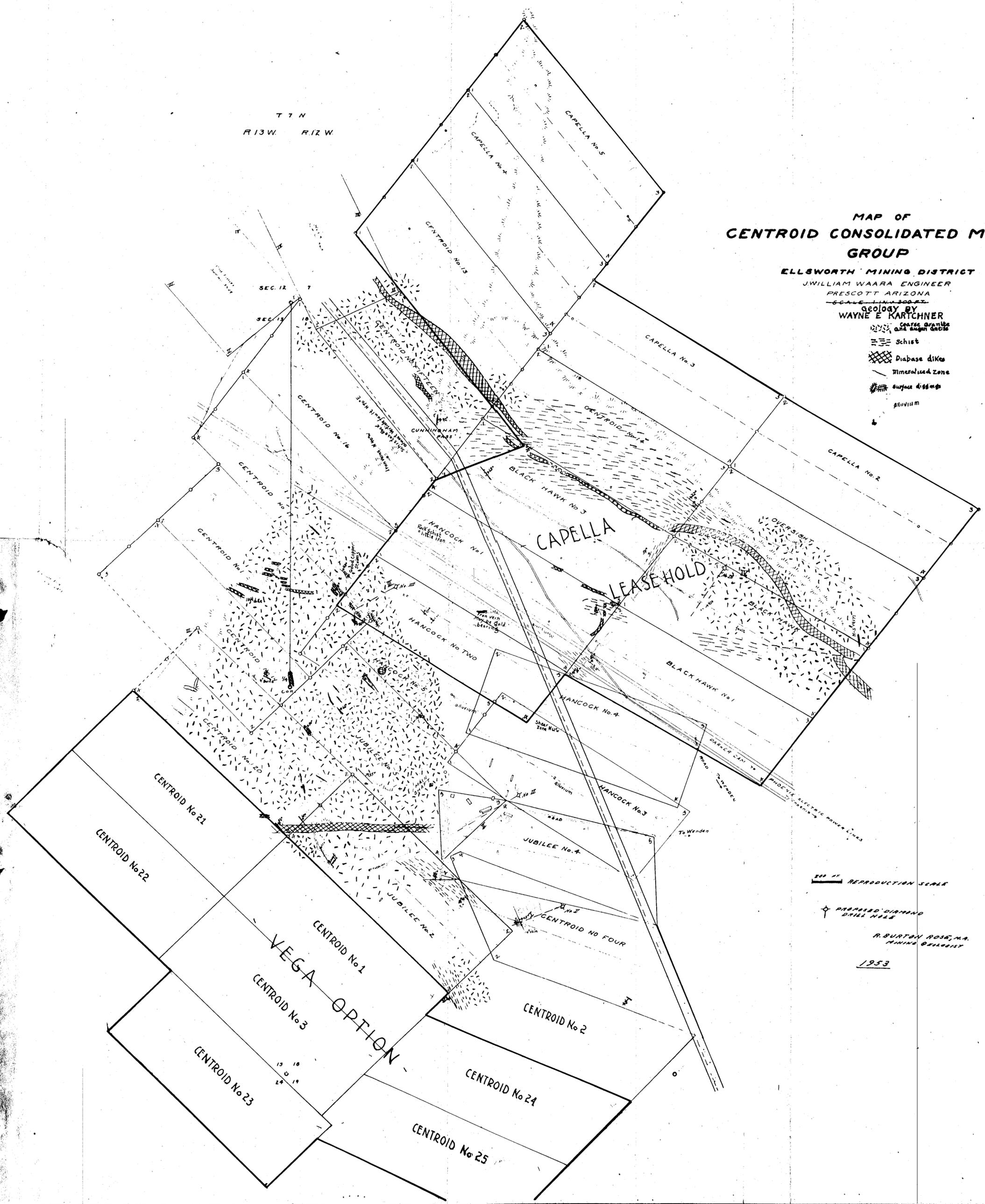
T 7 N
R 13 W R 12 W

MAP OF CENTROID CONSOLIDATED MINES GROUP

ELLSWORTH MINING DISTRICT
J WILLIAM WAARA ENGINEER
PRESCOTT ARIZONA

SCALE 1 IN = 200 FT
GEOLOGY BY
WAYNE E KARTCHNER

- coarse granite and sugar dials
- schist
- Diabase dikes
- Mineralized Zone
- surface ditches
- alluvium



200 FT REPRODUCTION SCALE

ABANDONED DIAMOND DRILL HOLES

R. BURTON ROSE, M.A.
MINING GEOLOGIST

1953