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Geologic and Engineering Report of the

Centroid Mine

of

Centroid Consolidated Mines Inc.
Ellworth Mining District Yuma Co. Arizona

By

R.E. Mieritz
Mining Consultant
Phoenix, Arizona

August 30, 1957

GEOLOGIC and ENGINEERING

REPORT

of the

CENTROID MINE

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CENTROID CONSOLIDATED MINES INC.

ELLSWORTH MINING DISTRICT

YUMA COUNTY, ARIZONA

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Composite Diamond Drill Log-Hole 2--2 sheets

Composite Diamond Drill Log-Hole 3--2 sheets

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Composite Diamond Drill Log-Hole 8--2 sheets

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 amendable to a simple flotation process with expected high recoveries.

INTRODUCTION

The Centroid Consolidated Mines copper property in the Cunnigham 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. Kostolnik, 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. 16	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 Preformance of Annual Assessment work are recorded at the County Recorders 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

Occurances 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 1½ 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 occuring 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 persistant 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. Needs Handbook 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 ½ 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 to far distant and served by the Santa Fe Railroad.

Housing:

The property is well equiped at this time, with minor repairs, to accomodate 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 1½ 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 Harcuvar 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-diabase series along with those approaching a pegmatic texture where 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-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. Tevote it is stated,

"Other intrusions are dikes of diabase or diorite, or both. Near Cunningham Pass these dikes resemble diabase, but furthur west, they are decidely 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 a 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 chalcopyrite, 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 Eck 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 Shim 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 persistant structure which parallels a sporatic 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 judically with the several then existing problems. One such problem was the failure to receive all records and infromation 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 judically proceeding with the devlopment of the Centroid property through professional guidance then accepted. Unreplemished funds contributed to and accounted for sporadic and limited development these past few years.

Early management thought it adviseable to develope the Horse Whim structure by deepening the inclined shaft and completing several hunderd 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 a diamond drill hole 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 core 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 on 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 assy 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 stingers, no other mineralization was evidenced below the 200 foot depth.

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

should continue to indicate the existance 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 coincidential and associated with a sporatic diabase dike. This particular structures 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 identifyable 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 strined structure on which a short shaft had been sunk. A granular quartz zone of 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 lineation 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 southeast 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 existance 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 a 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 mustdefinitely 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,

R. 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 preceeding 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 preceeding 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 develope 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 responcibility 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 structe 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) Avg. $6.00/ft	$57,000
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%	9,000
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 existant 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 <u>just</u> 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)

Mine	Reserves	Type	Grade	Value (27¢ copper)
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% (½ for each area)	$ 3,300	
Sub Total		$ 3,300

Minihg

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.

Respectully submitted,

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

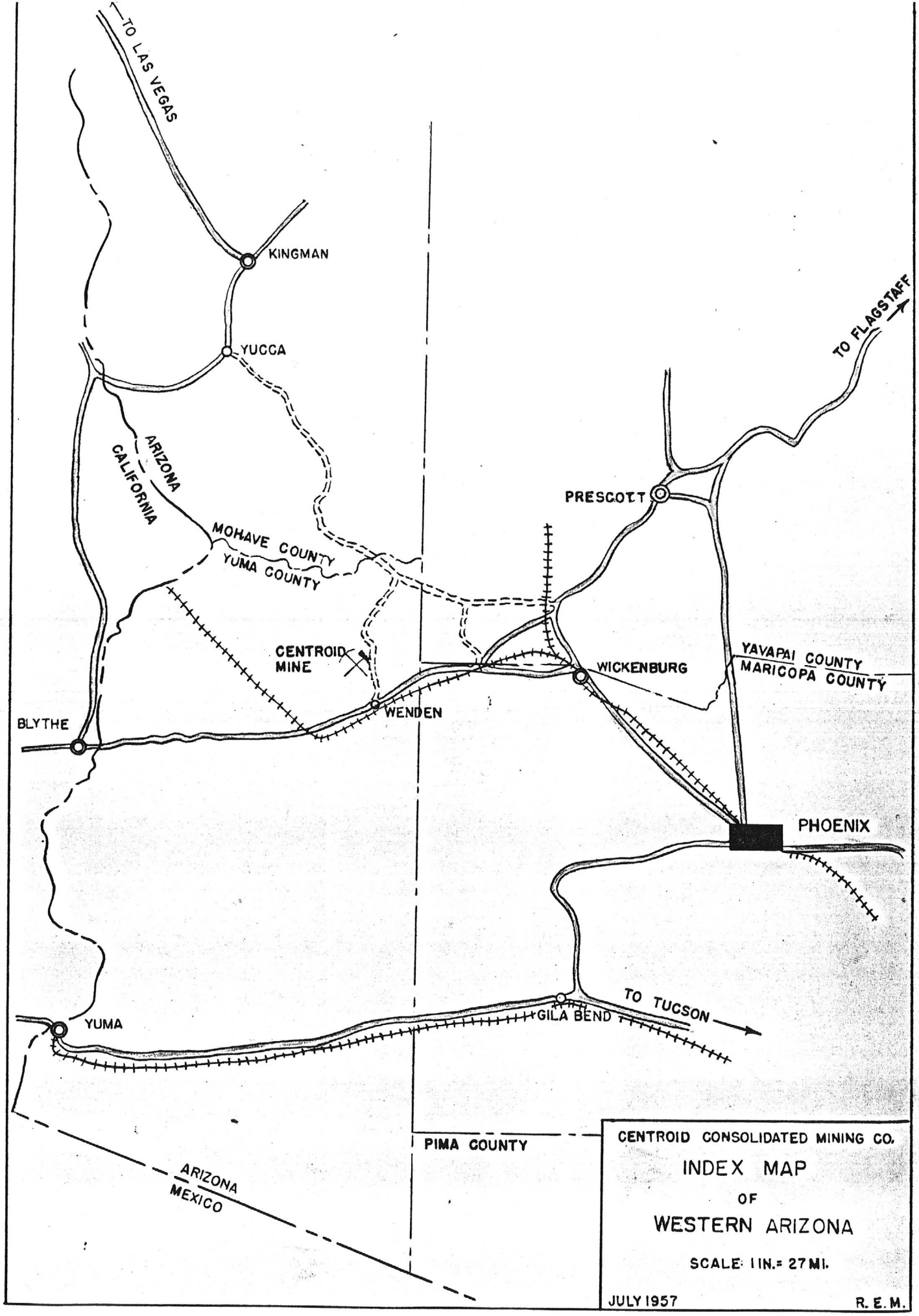

TO LAS VEGAS
KINGMAN
YUCCA
TO FLAGSTAFF
ARIZONA
CALIFORNIA
PRESCOTT
MOHAVE COUNTY
YUMA COUNTY
CENTROID MINE
WICKENBURG
YAVAPAI COUNTY
MARICOPA COUNTY
WENDEN
BLYTHE
PHOENIX
TO TUCSON
GILA BEND
YUMA
PIMA COUNTY
ARIZONA
MEXICO
CENTROID CONSOLIDATED MINING CO.
INDEX MAP
OF
WESTERN ARIZONA
SCALE: 1 IN.= 27 MI.
JULY 1957
R. E. M.

PLATE I

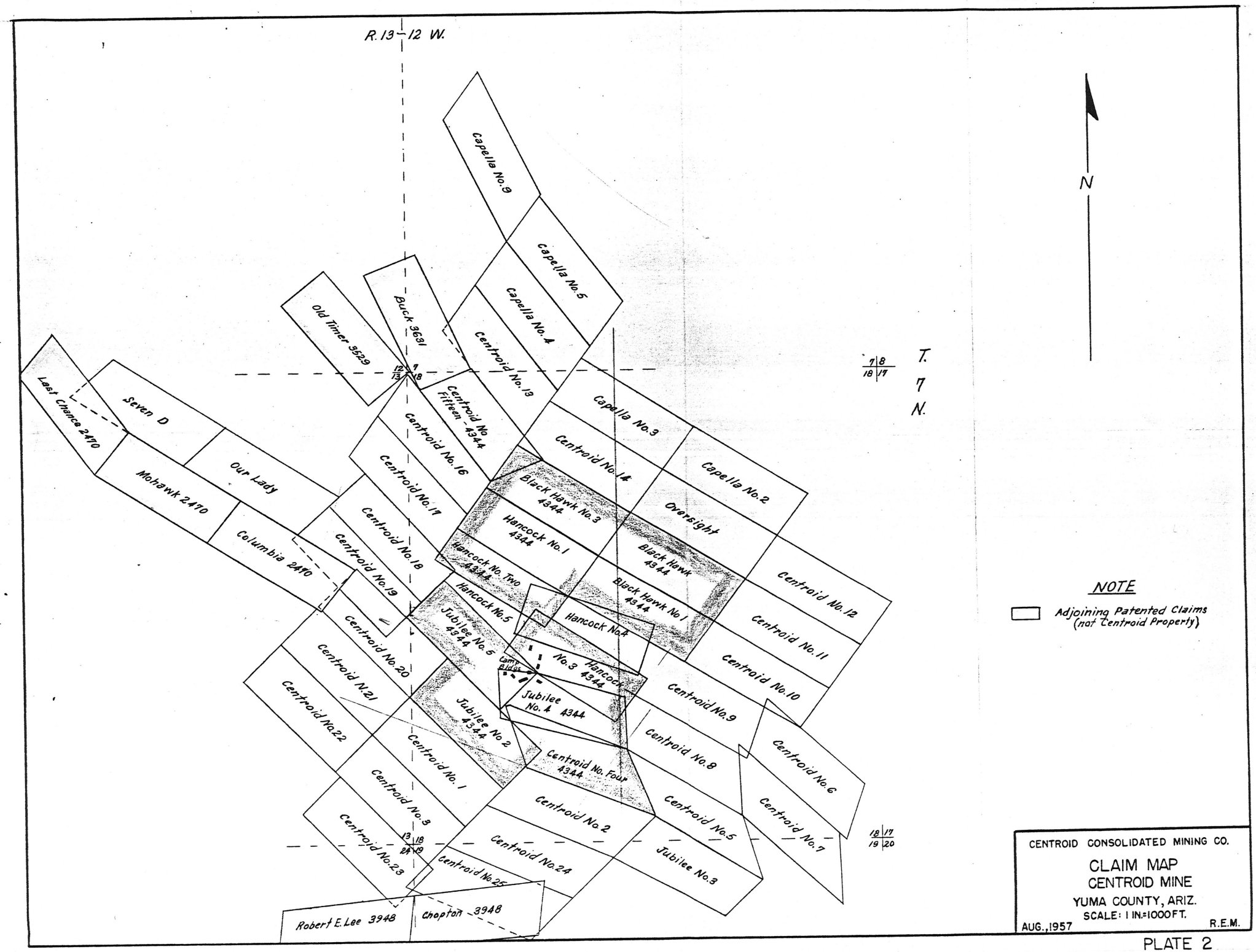

R. 13 – 12 W.
T. 7 N.
N
Capella No. 9
Capella No. 5
Capella No. 4
Capella No. 3
Capella No. 2
Old Timer 3529
Buck 3631
Centroid No. 13
Centroid No. 14
Centroid No. Fifteen 4344
Centroid No. 16
Centroid No. 17
Centroid No. 18
Centroid No. 19
Centroid No. 20
Centroid N. 21
Centroid No. 22
Centroid No. 23
Centroid No. 24
Centroid No. 25
Centroid No. 1
Centroid No. 2
Centroid No. 3
Centroid No. 5
Centroid No. 6
Centroid No. 7
Centroid No. 8
Centroid No. 9
Centroid No. 10
Centroid No. 11
Centroid No. 12
Last Chance 2470
Seven D
Mohawk 2470
Our Lady
Columbia 2470
Black Hawk No. 3 4344
Hancock No. 1 4344
Hancock No. Two 4344
Hancock No. 5
Jubilee No. 5 4344
Black Hawk 4344
Black Hawk No. 1
Hancock No. 4
Hancock No. 3 4344
Jubilee No. 4 4344
Jubilee No. 2 4344
Centroid No. Four 4344
Jubilee No. 3
Oversight
Camp Bidos
Robert E. Lee 3948
Chapton 3948
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.

PLATE 2

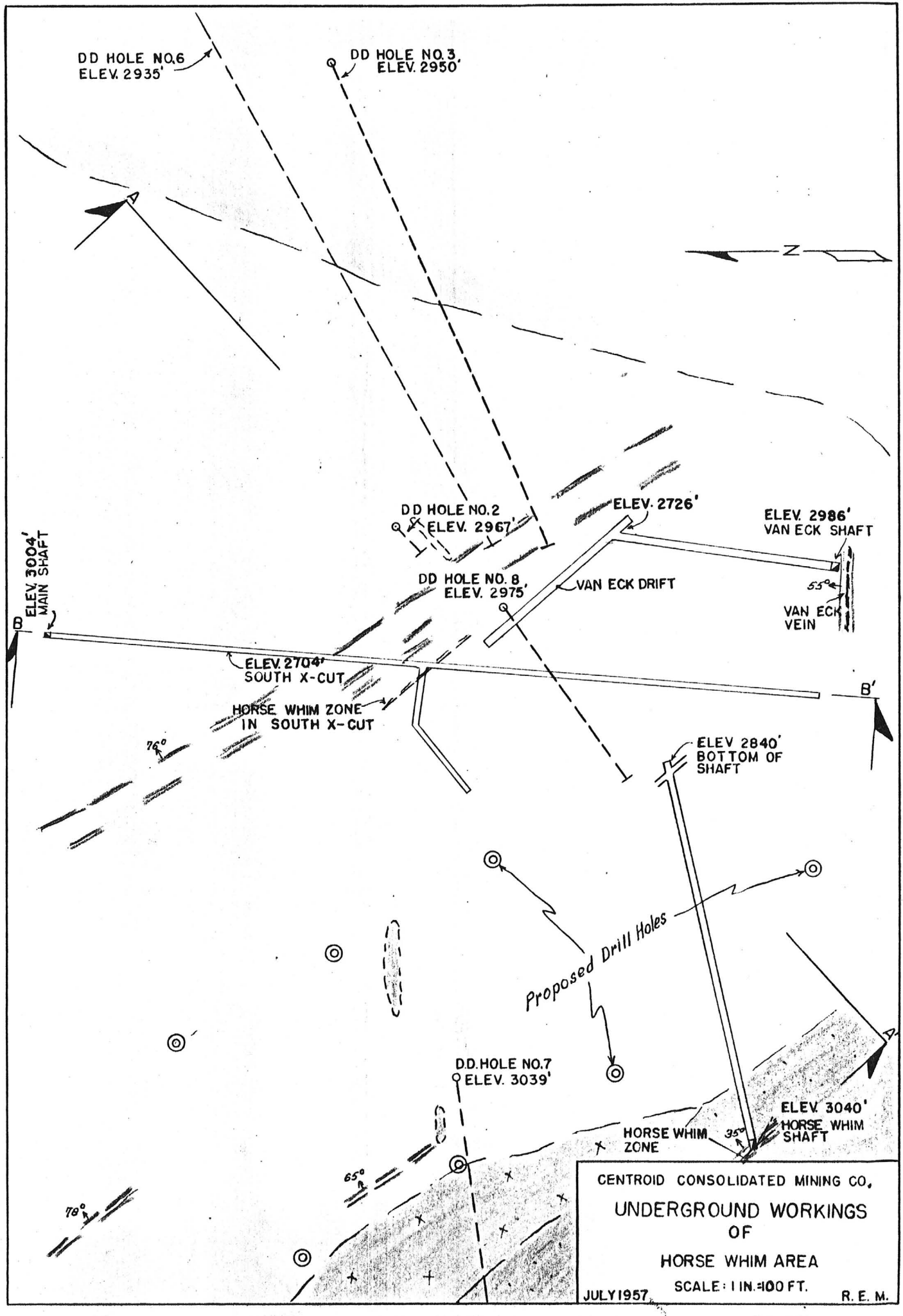

DD HOLE NO.6
ELEV. 2935'
DD HOLE NO.3
ELEV. 2950'
N
DD HOLE NO.2
ELEV. 2967'
ELEV. 2726'
ELEV. 2986'
VAN ECK SHAFT
ELEV. 3004'
MAIN SHAFT
DD HOLE NO. 8
ELEV. 2975'
VAN ECK DRIFT
55°
VAN ECK
VEIN
B
ELEV. 2704'
SOUTH X-CUT
B'
HORSE WHIM ZONE
IN SOUTH X-CUT
76°
ELEV 2840'
BOTTOM OF
SHAFT
Proposed Drill Holes
D.D. HOLE NO.7
ELEV. 3039'
ELEV 3040'
HORSE WHIM
SHAFT
HORSE WHIM
ZONE
35°
65°
78°
CENTROID CONSOLIDATED MINING CO.
UNDERGROUND WORKINGS
OF
HORSE WHIM AREA
SCALE: 1 IN.=100 FT.
JULY 1957
R. E. M.

PLATE 4

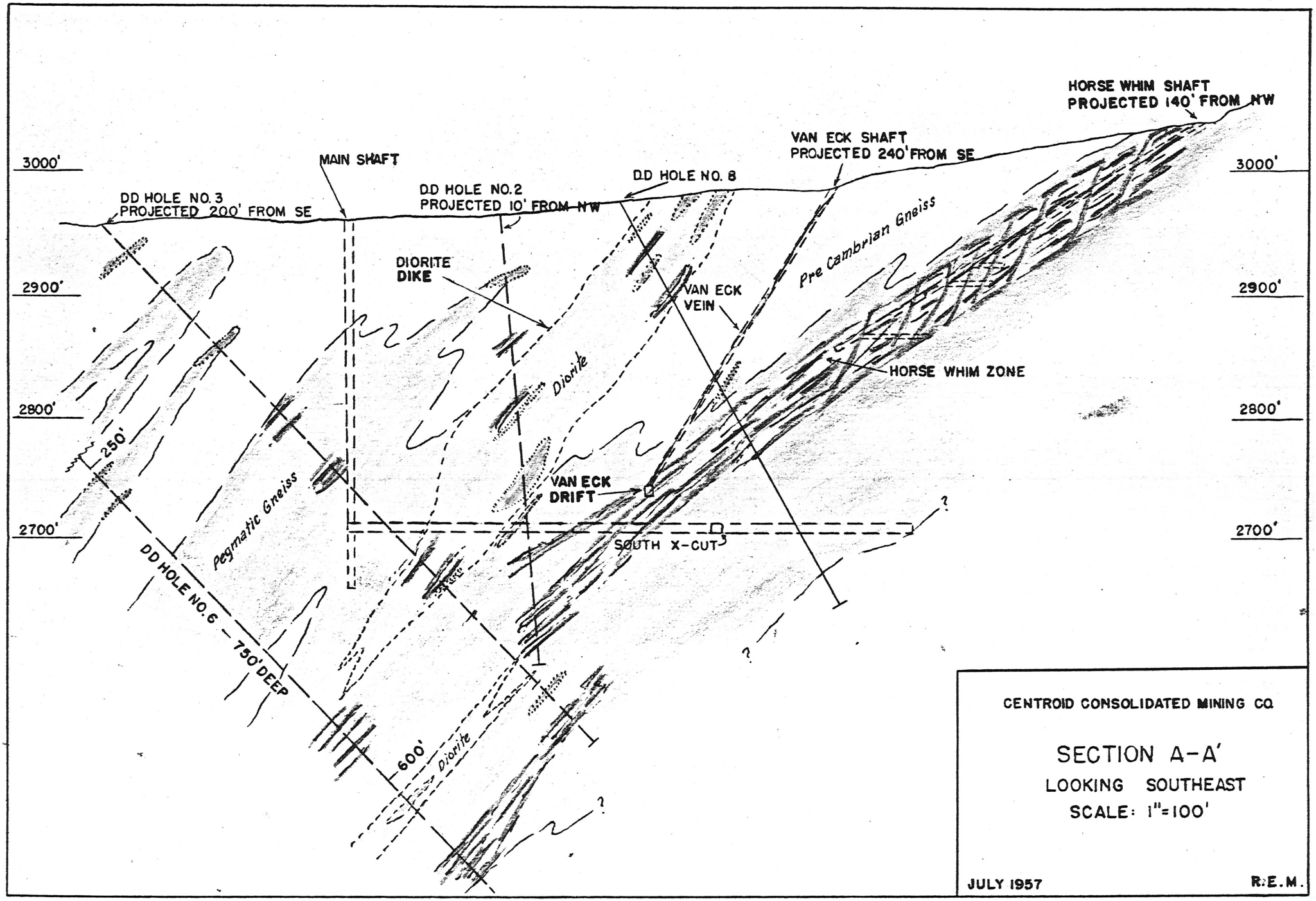

HORSE WHIM SHAFT
PROJECTED 140' FROM NW
VAN ECK SHAFT
PROJECTED 240' FROM SE
MAIN SHAFT
DD HOLE NO. 8
DD HOLE NO. 2
PROJECTED 10' FROM NW
DD HOLE NO. 3
PROJECTED 200' FROM SE
3000'
2900'
2800'
2700'
DIORITE
DIKE
VAN ECK
VEIN
Pre Cambrian Gneiss
Diorite
HORSE WHIM ZONE
250'
VAN ECK
DRIFT
SOUTH X-CUT
Pegmatic Gneiss
DD HOLE NO. 6 - 750' DEEP
600'
Diorite
CENTROID CONSOLIDATED MINING CO.
SECTION A-A'
LOOKING SOUTHEAST
SCALE: 1"=100'
JULY 1957
R.E.M.

PLATE 5

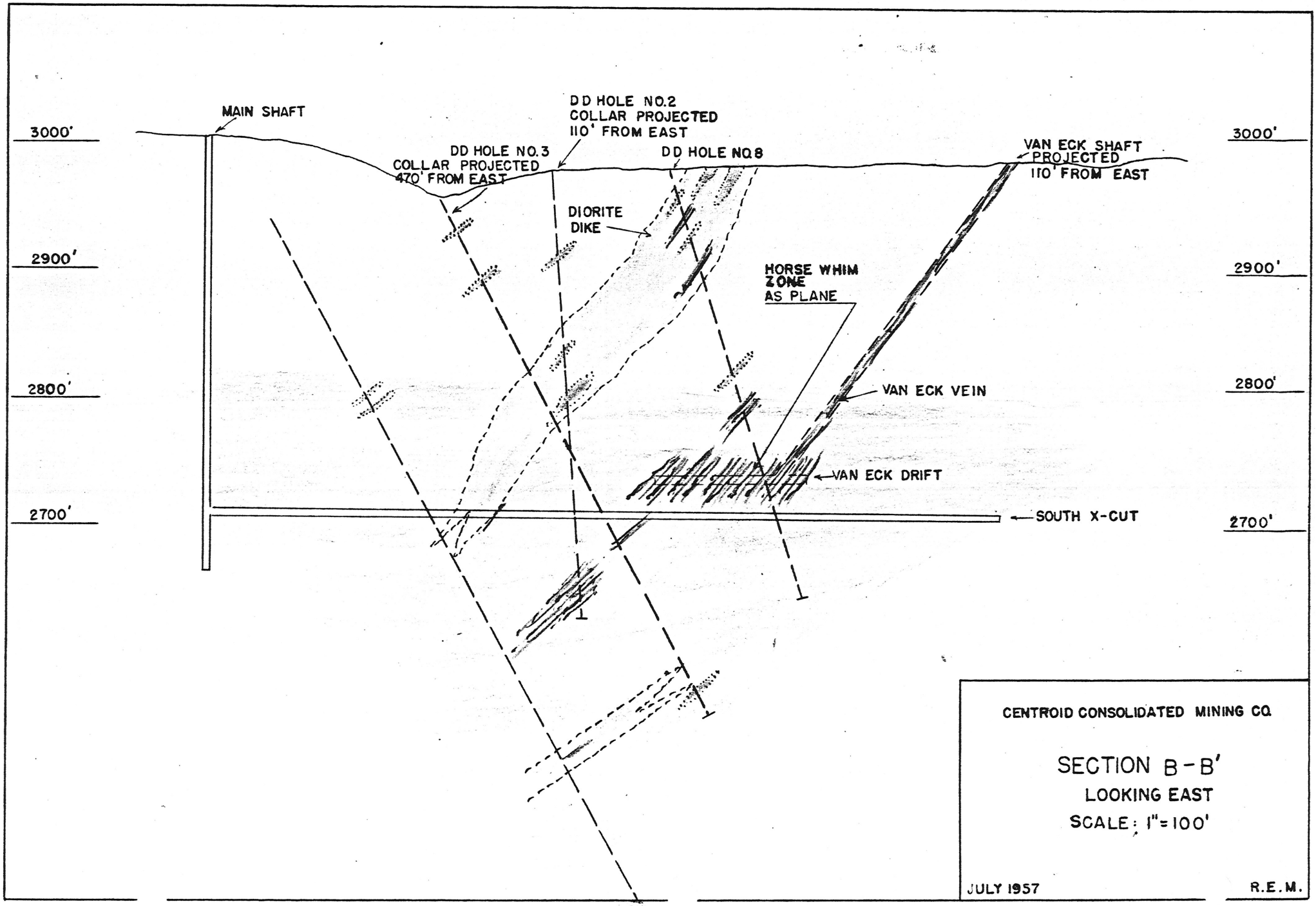
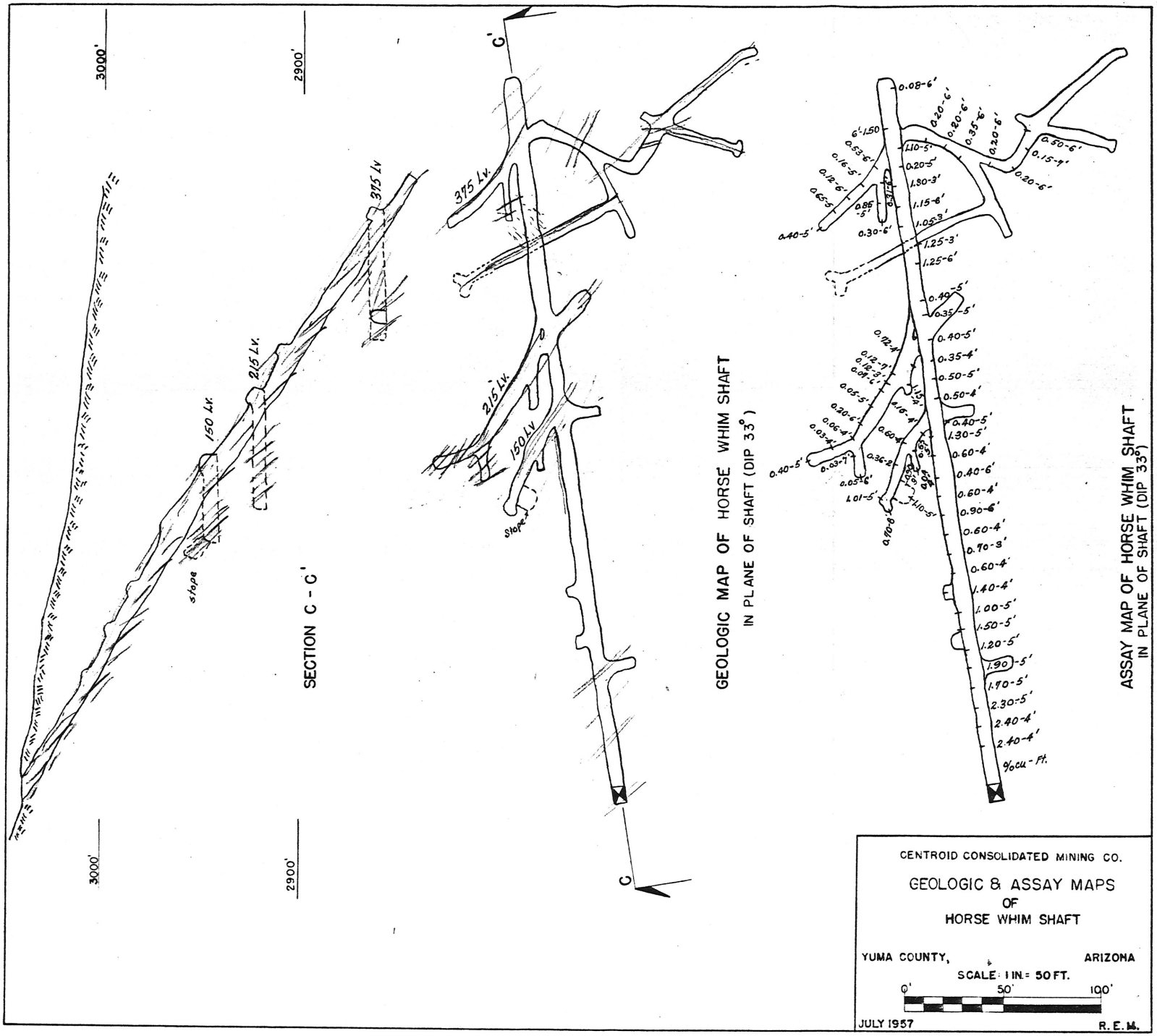

MAIN SHAFT
DD HOLE NO.2
COLLAR PROJECTED
110' FROM EAST
DD HOLE NO.3
COLLAR PROJECTED
470' FROM EAST
DD HOLE NO.8
VAN ECK SHAFT
PROJECTED
110' FROM EAST
DIORITE
DIKE
HORSE WHIM
ZONE
AS PLANE
VAN ECK VEIN
VAN ECK DRIFT
SOUTH X-CUT
3000'
2900'
2800'
2700'
CENTROID CONSOLIDATED MINING CO.
SECTION B-B'
LOOKING EAST
SCALE: 1"=100'
JULY 1957
R.E.M.

PLATE 6



CENTROID CONSOLIDATED MINING CO.

GEOLOGIC & ASSAY MAPS
OF
HORSE WHIM SHAFT

YUMA COUNTY, ARIZONA

SCALE: 1 IN. = 50 FT.

0' 50' 100'

JULY 1957 R. E. M.

PLATE 7

COMPOSITE DIAMOND DRILL LOG

HOLE № 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 SIZE	CORE RUNS	REC.%	MINERALIZATION	ASSAYS % Cu
5			Gneissic granite - strongly silicified, some veinlets blood red hematite along fractures.		NX				
10									
15									
20						20			
25									
30									
35									
40						40			
45			Pegmatite - high in feldspar						
50									
55									
60			Strongly pegmatic.		BX	60			
65	2900								
70									
75									
80						80			
85									
90									
95									
100						100			
105									
110									
115									
120						120			
125									
130			Diorite						
135									
140						140			
145									
150									
155			Pegmatite						
160						160			
165	2800								
170									
175									
180			Diorite			180			
185									
190									
195									
200					AX	200			
205									
210			Gneissic granite						
215									
220						220			
225			Diorite						
230			Pegmatite						
235			Gneissic granite						
240			Diorite			240			
245			Gneissic granite - strong pegmatic						
250			Moderate chalcopyrite mineralization.						
255									
260						260			
265	2700								
270									0.30
275									0.70
280			Pegmatite - strong blood red hematite stringers. Highly altered			280			0.10
285									
290									
295									
300						300			

20% 60% Cpy. Cu Ox. FeOx

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 2 cont'd.

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 SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % Cu
5			Gneissic granite - strongly pegmatic, highly altered, strong blood red hematite vein - with moderate chalcopyrite mineralization.		AX				
10									
15									
20						20			0.01
25									0.50
30									0.15
35									0.80
40						40			
45									
50									
55									
60						60			
65			T.D.						
70							2.0%		
75							8.0%		
80						80	10.0%	Cpy	
85									
90									
95									
100						100			
105									
110									
115									
120						120			
125									
130									
135									
140						140			
145									
150									
155									
160						160			
165									
170									
175									
180						180			
185									
190									
195									
200						200			
205									
210									
215									
220						220			
225									
230									
235									
240						240			
245									
250									
255									
260						260			
265									
270									
275									
280						280			
285									
290									
295									
300						300			

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

20 60 100 Cpy Cu Ox Fe Ox

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 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: 6-19-55 DATE COMP: 7-31-55

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: —— CASING: — —	CORE SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % Cu
5			Gneissic granite – Strongly pegmatic						
10									
15									
20						20			
25									
30									
35									
40						40			
45									
50	2700								
55			Veinlets blood red hematite, some chalcopyrite						
60						60			
65			Diorite with ½" seam of pegmatite. Hematite & chalcopyrite.						
70									
75									
80						80			
85			Strongly pegmatic						
90									
95									
100						100			
105									
110									
115									
120						120			
125									
130									
135									
140					Ex	140			
145									
150									
155									
160						160			
165									
170									
175									
180						180			
185									
190									
195	2600		Diorite with pegmatite dike						
200						200			
205									
210									
215									
220						220			
225			Diorite with ½' pegmatite.						0.15
230									
235			Veinlets blood red hematite - some chalcopyrite.						
240						240			
245									
250									
255									
260						260			
265									
270									
275									
280						280			
285									
290									
295			T.D.						
300						300			

20 60 120 Cpy Cu% Fe%

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 4

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Black Hawk DISTRICT: Ellsworth

COUNTY: Yuma STATE: Arizona TWS: 7 N. RGE: 12 W. 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
5, 10, 15, 20			Overburden.
25, 30, 35, 40			Gneiss - Fresh, good liniarity of micas.
45, 50			Pegmatite ? Quartz & feldspar-
55, 60, 65, 70, 75, 80			Diorite - Schistic in character - weathered.
85	2900		Diorite
90, 95, 100, 105, 110, 115			mica looses liniarity below 96 ft.
120, 125, 130, 135, 140			Diorite - gray - finegrained Gneiss - fresh - finer or closer mica banding.
145, 150			Pegmatite - Quartz & feldspar, brown & yellow FeO_x, some cpy, py - some mica altered
155, 160, 165, 170, 175, 180, 185, 190, 195, 200			Diorite Gneiss - many bands quartz, feldspar (altered) little mica, oacssional speck chalcopyrite, pyrite. Core badly broken, not fragmental.
205	2800		more mica 200-211 - liniarity very closely spaced.
210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260			Gneiss - very altered, bands of quartz & feldspars little mica, mostly as blotches. Possible target intersection below 210 ft.
265			T.D.
270, 275, 280, 285, 290, 295, 300			

HOLE: ——— CASING: - - -

CORE: SIZE — Ex; RUNS — 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300; REC% — 20, 60, 100

MINERALIZATION: cpy, CuO_x, FeO_x

ASSAYS %: Cu

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 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 SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % Cu
5			Gneissic granite, pegmatite at 42.9' to 43.2'		BX				
10									
15									
20						20			
25									
30									
35									
40						40			
45									
50	2900								
55									
60						60			
65									
70									
75			Gneissic granite, slightly pegmatic, many small stringers & veinlets of blood red hematite						
80						80			
85									
90									
95									
100						100			
105									
110									
115									
120						120			
125									
130									
135									
140						140			
145									
150					AX				
155									
160						160			
165									
170									
175									
180						180			
185									
190	2800								
195			Pegmatite						
200						200			
205									
210									
215									
220						220			
225									
230									
235			Pegmatite						
240						240			
245									
250									
255									
260						260			
265									
270									
275									
280			Pegmatite			280			
285									
290									
295									
300						300			

20 60 100 Cpy CuOx FeOx

COMPOSITE DIAMOND DRILL LOG

HOLE № 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 SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % Cu.
5			Gneissic granite - slightly pegmatic						
10									
15									
20						20			
25									
30									
35									
40						40			
45	2700								
50									
55									
60						60			
65									
70									
75									
80						80			
85									
90									
95									
100			Strongly pegmatic			100			
105									
110									
115									
120						120			
125			Slightly pegmatic						
130									
135									
140			Few stringers blood red hematite at 432'			140			
145			Strongly pegmatic						
150									
155					AX				
160						160			
165									
170	2600		Pegmatite						
175									
180						180			
185									
190									
195									
200			Slightly pegmatic			200			
205									
210									
215									
220						220			
225			Pegmatite						
230			Strongly pegmatic						
235			Several stringers blood red hematite with some						
240			chalcopyrite.			240			
245									
250									
255									
260			Highly altered 554' to 591'			260			
265									
270									
275									
280						280			
285									
290									
295									
300						300			

20 60 100 Cpy Cu Ox Fe Ox

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 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 SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % Cu
5			Gneissic granite - slightly pegmatic						
10	2500								
15			Strongly pegmatic						
20			Diorite			20			
25									
30			Diorite						
35			Few blood red veinlets hematite 633'-35'						
40			Slightly pegmatic (some chalcopyrite)			40			
45									
50			Strongly pegmatic						
55									
60						60			
65									
70									
75					AX				
80						80			
85									
90									
95									
100						100			
105									
110			Slightly pegmatic						
115			Few veinlets blood red hematite 722'						
120						120			
125									
130									
135									
140						140			
145									
150			T.D.						
155	2400								
160						160		Cpy	
165								Cu Ox	
170								Fe Ox	
175									
180						180			
185									
190									
195									
200						200			
205									
210									
215									
220						220			
225									
230									
235									
240						240			
245									
250									
255									
260						260			
265									
270									
275									
280						280			
285									
290									
295									
300						300			

20 60 100

COMPOSITE DIAMOND DRILL LOG

HOLE № 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 SIZE	CORE RUNS	CORE REC%	MINERALIZATION	ASSAYS % Cu
5–300	3000		Gneissic granite, many small stringers & veinlets of blood red hematite – strongly pegmatic		BX, AX	20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300	20, 60, 100	CpY, CuO, FeOx	
190–250	2900		Gneissic Granite – slightly pegmatic, strong hematite at gradational change.						
250–300			Gneissic granite, strongly pegmatic.						

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: 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 SIZE	CORE RUNS	CORE REC%	MINERALIZATION	ASSAYS % Cu
5, 10, 15, 20, 25, 30, 35, 40, 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, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300	2800; 2700		Gneissic granite - strongly pegmatic; Diorite, last 6" of hole. T.D.		AX	20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300	20, 60, 100	Cpy, Cu_2O, FeO_2	

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 8

COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No.5 DISTRICT: Ellsworth

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
5–15			Gneissic granite
20–45			Basalt, bands of pegmatite & gneissic granite.
85	2900		
95–190			Gneissic granite - strongly pegmatic
190–300			Pegmatite
200	2800		

HOLE: ——— CASING: - - -

Reamed BX.

CORE — SIZE: BX, AX

RUNS — REC.%

MINERALIZATION: CpY, CuOx, FeOx

ASSAYS % — Cu: 0.10, 0.05

COMPOSITE DIAMOND DRILL LOG

HOLE Nº 8 cont'd

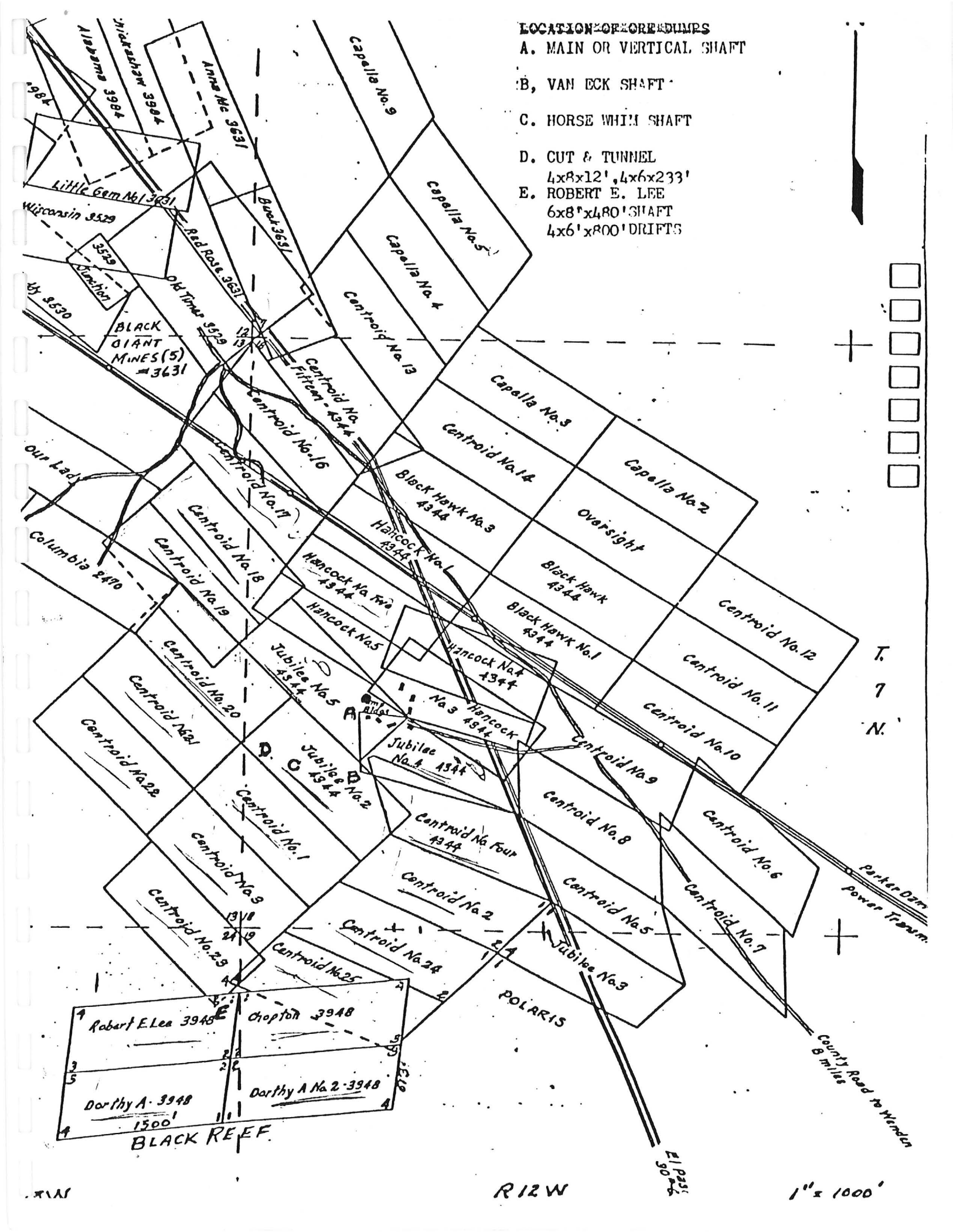
COMPANY: Centroid Consolidated Mining MINE: Centroid CLAIM: Jubilee No. 5 DISTRICT: Ellsworth

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 SIZE	CORE RUNS	CORE REC%	MINERALIZATION	ASSAYS % Cu
305			Gneissic granite - strongly pegmatic						
10	2700								
15									
20						20			
325									
30									
35					Ax				
40			Gneissic granite - moderately pegmatic.			40			
45									
350									
55									
60						60			
65									
70			T.D.						
375									
80						80		Cpy, CuOx, FeOx	
85									
90									
95									
100						100			
105									
110									
115									
120						120			
125									
130									
135									
140						140			
145									
150									
155									
160						160			
165									
170									
175									
180						180			
185									
190									
195									
200						200			
205									
210									
215									
220						220			
225									
230									
235									
240						240			
245									
250									
255									
260						260			
265									
270									
275									
280						280			
285									
290									
295									
300						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
Alabama 3984
Chickasaw 3984
Anna Mc 3631
Capella No. 9
Little Gem No 1 3631
Wisconsin 3529
Buck 3631
Red Rose 3631
Capella No. 5
Capella No. 4
Old Timer 3529
BLACK GIANT MINES (5) #3631
Centroid No. 13
Centroid No. Fifteen - 4344
Centroid No. 16
Capella No. 3
Centroid No. 14
Capella No. 2
Our Lady
Centroid No. 17
Black Hawk No. 3 4344
Hancock No. 4344
Oversight
Columbia 2410
Centroid No. 18
Centroid No. 19
Hancock No. Five 4344
Black Hawk 4344
Black Hawk No. 1 4344
Centroid No. 12
Hancock No. 5
Hancock No. 4 4344
Centroid No. 11
Jubilee No. 5 4344
Centroid No. 20
Centroid No. 21
Hancock No. 3 4344
Jubilee No. 4 4344
Centroid No. 10
Centroid No. 9
Centroid No. 22
Jubilee No. 2 4344
Centroid No. 1
Centroid No. Four 4344
Centroid No. 8
Centroid No. 6
Centroid No. 3
Centroid No. 2
Centroid No. 5
Centroid No. 7
Centroid No. 23
Centroid No. 24
Centroid No. 25
Jubilee No. 3
POLARIS
Robert E. Lee 3948
Chopton 3948
Dorthy A. 3948
Dorthy A No. 2 3948
1500'
BLACK REEF
Parker Dam Power Transm.
County Road to Wenden 8 miles
El Paso 90
T. 7 N.
R 12 W
1" = 1000'

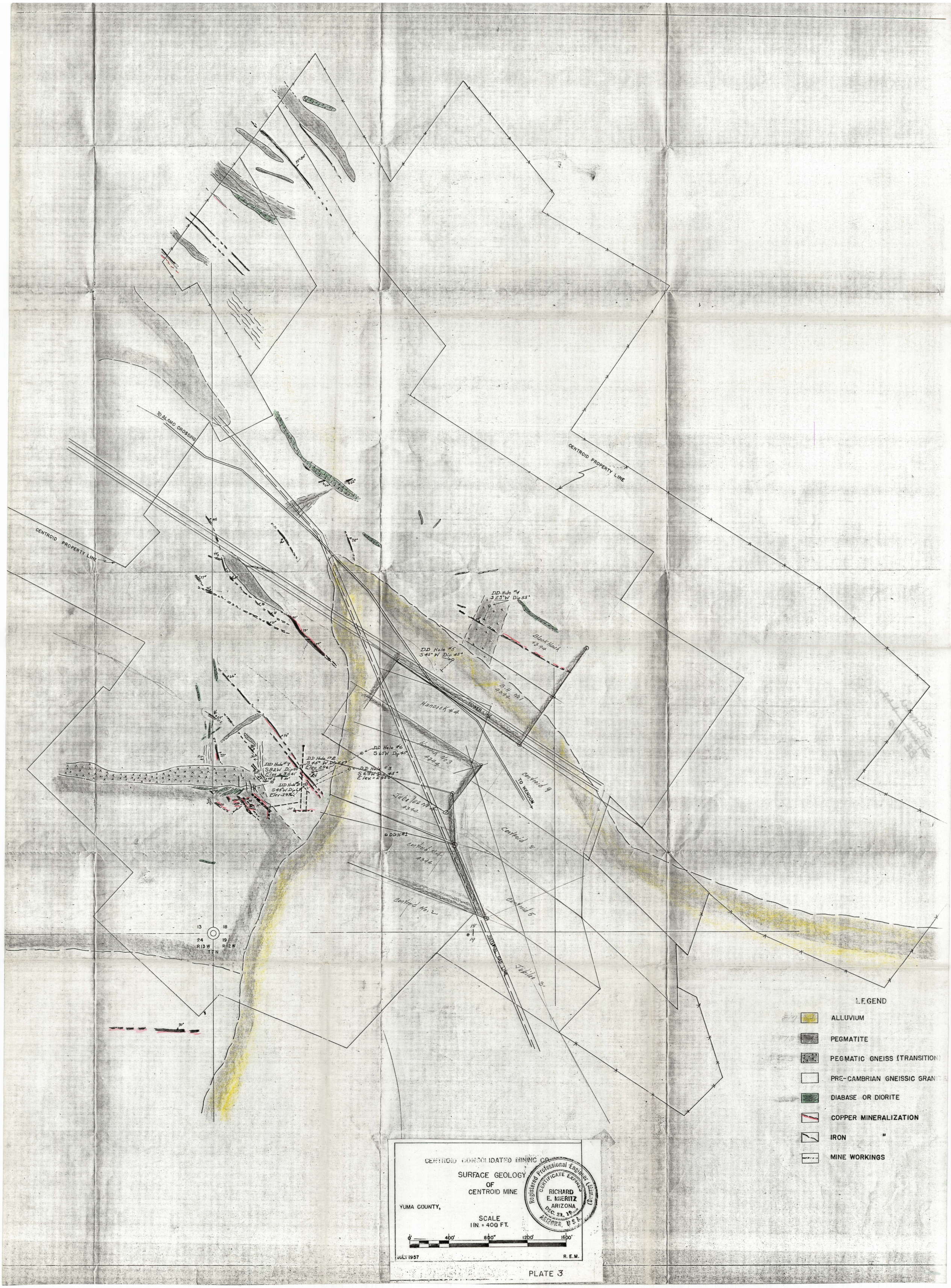

TO ALAMO CROSSING
CENTROID PROPERTY LINE
CENTROID PROPERTY LINE
DD Hole #4
S 25°W Dip 55°
DD Hole #5
S 45° W Dip 45°
Black Hawk
#3 Pit
B.H. No 1
4344
POWER LINE
Hancock #4
DD Hole #6
S 60W Dip 45°
Hancock No 3
4344
DD Hole #7
S82W Dip 45
Elev 3041'
DD Hole #2
S45° W Dip 55°
Elev 2961'
DD Hole #3
S 63W Dip 45°
Elev = 2930'
DD Hole #1
S45W Dip 60
Elev 2917'
Tubular No 4
4344
Centroid 9
TO WENDOM
Centroid 5
DD.H. #1
Centroid #4
4344
Centroid No. 2
Centroid 5
NATURAL GAS LINE
Tubular 3
13
18
24
19
R13W
R12W
T7N
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.
0'
400'
800'
1200'
1600'
JULY 1957
R. E. M.
Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
RICHARD
E. MUERITZ
ARIZONA
DEC. 31, 19
ARIZONA, U.S.A.

PLATE 3