CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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Nov. 1, 1974

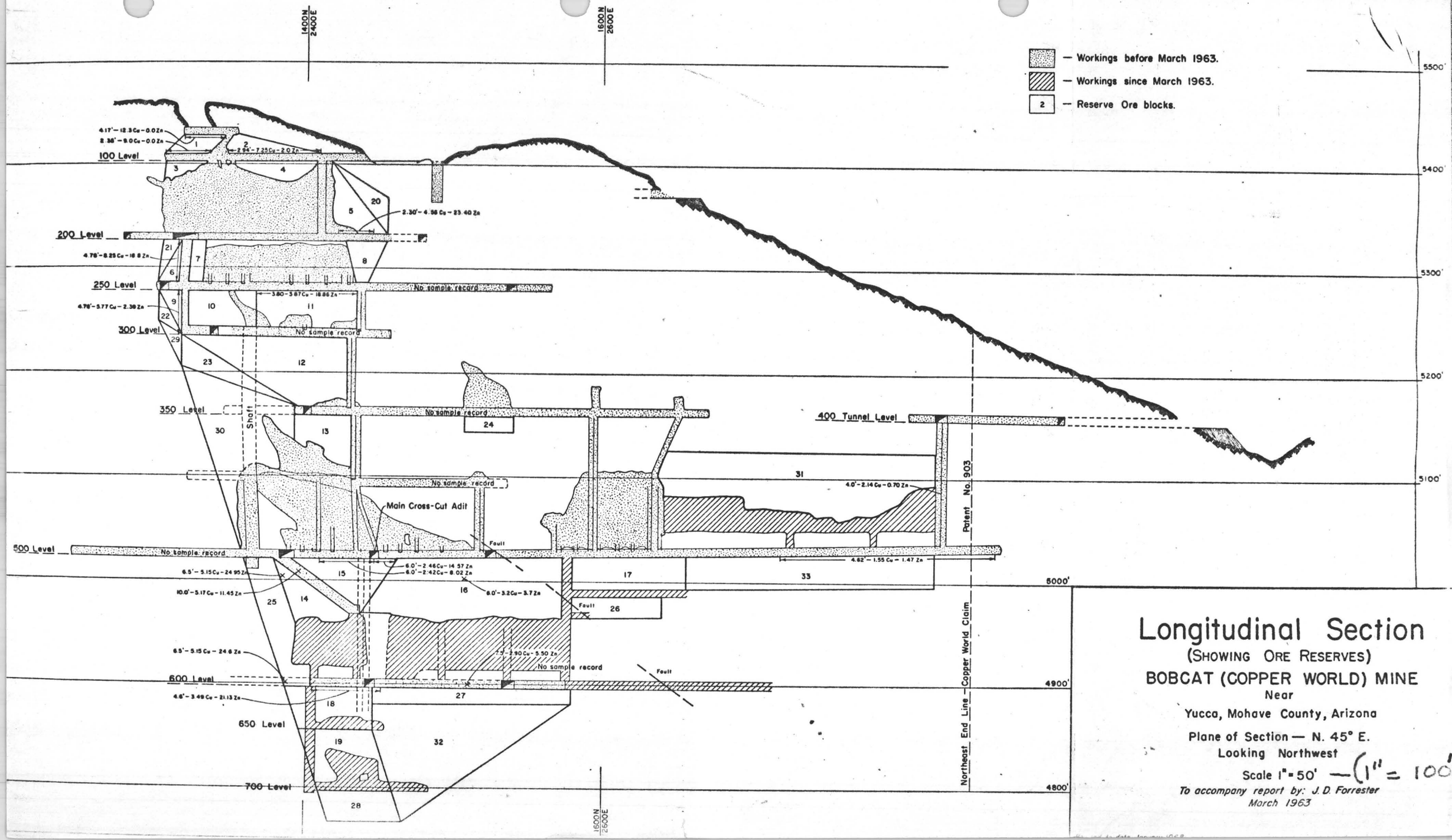
Copper World Mine
Secs. 25, 36 T 18 N, R 16W
Near Yucca, Ariz.

From data supplied: Report by F. B. Silman Aug 18 '66
and others including
Allan G. Bird Mgr of Explor. for
Standard Metals Silverton Colo
June 21, 1970

A narrow vein 4' avg. Cu/Zn 1/4 to 1/4
One main oreshoot already worked out
down to approx 200' level as wide
as 15' ft in places, grade combined Cu and
Zn up to 16%; probable avg. at depth more
like 7%.

Main oreshoot represents something like
80 to 100 tons per ft. of depth; there
are no potential reserves of ~~[illegible]~~ enough
consequence to be of interest, even
if the grade of the ore were in
the vicinity of $60 ton (Cu @ $0.70, and
Zn @ $0.30)

HXC.



Longitudinal Section

(SHOWING ORE RESERVES)

BOBCAT (COPPER WORLD) MINE

Near

Yucca, Mohave County, Arizona

Plane of Section — N. 45° E.

Looking Northwest

Scale 1" = 50' — (1" = 100')

To accompany report by: J. D. Forrester

March 1963

GEOLOGICAL AND GEOPHYSICAL INVESTIGATIONS OF THE COPPER WORLD MINE

STANDARD COPPER CORPORATION

by

Jack F. B. Silman

18 August 1966

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GEOLOGICAL AND GEOPHYSICAL INVESTIGATIONS

OF

THE COPPER WORLD MINE

STANDARD COPPER CORPORATION

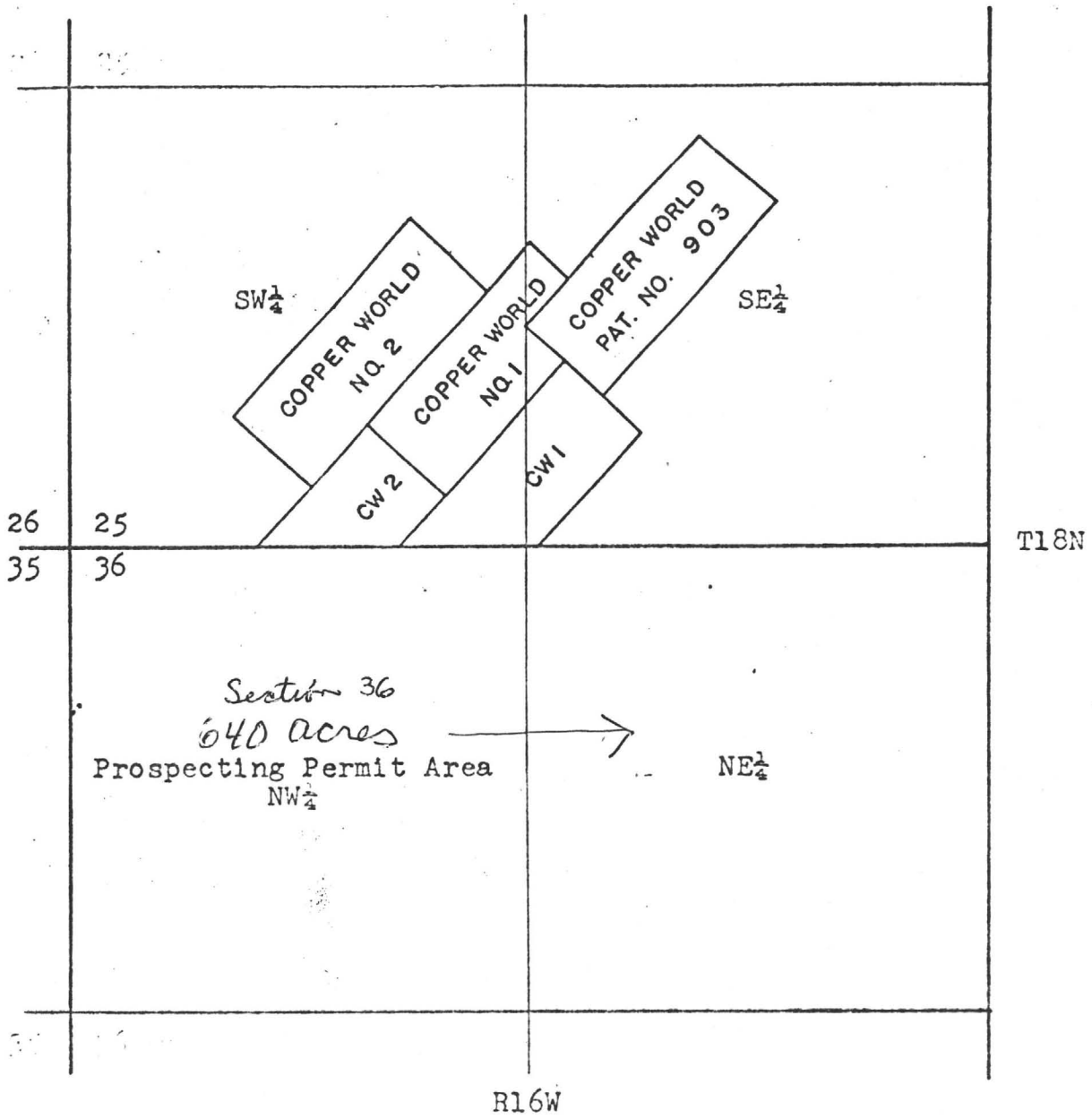
INTRODUCTION

The Copper World Mine, located in S25, T18N, R16W, Mohave County, Arizona, has been worked periodically for many years by various operators who mined copper and zinc ore from a section of the Copper World Vein approximately 400' in length and 450' in vertical extent. The bulk of the ore was produced from a high grade ore shoot comprising the southwest 200' of the vein. The boundaries of the old workings indicate that the southwest limits of the ore shoot were quite definite and abrupt. Development work and some exploratory drilling on several levels failed to locate a possible southwest extension of the vein.

The vein structure was explored northeast of the main ore shoot by development headings on several levels, but the mineralization in it apparently became sporadic, less extensive, lower grade and eventually uneconomic.

Geological and geophysical work was done on the property to evaluate additional ore possibilities during June and July, 1966. The geological work consisted of surface reconnaissance and underground detailed examination and mapping. Electromagnetic and self potential surveys were made over the known part and the projected extensions of the vein.

A Prospecting Permit was applied for on the NW¼ of State Section 36, T18N, R16W, and two claims, CW 1 and CW 2, were located in the SW¼ of S25, T18N, R16W to protect the projected southwest extension of the vein for a distance of approximately 4000 feet (see Figure 1).



Scale 1" = 1000'

Figure 1. Claims and Prospecting Permit Area of Standard Copper Corporation, S25 and 36, T18N, R16W, Mohave County, Arizona.

GEOLOGY

The Copper World Mine area is underlain by Precambrian gneisses that have a general trend of N30°E and an attitude of 85°NW (see Figure 2). The Copper World Vein occurs at and along the contact of two slightly different types of gneiss. The footwall gneiss, on the southeast side of the vein, is fine-grained, biotitic, siliceous and characteristically blocky or flaggy. The hanging wall gneiss, on the northwest side of the vein, is medium-grained to coarse-grained, also biotitic and siliceous, but not noticeably blocky. The hanging wall gneiss in the vicinity of the main, high grade, ore shoot has been hydrothermally altered and is colored reddish-brown to pink. Irregular, tabular masses of pegmatite have been introduced into the gneisses and are generally concordant with the gneissocity but locally they exhibit cross-cutting relationships. Numerous faults, slips and shears parallel and transect the gneissocity of the country rock.

The Copper World Vein occurs in a complex, thrust, fault zone that has an overall strike of about N45°E and a vertical dip. In detail, the fault zone pinches to less than 1 inch and swells to more than 10' wide, splits, comes together again and changes direction and attitude over relatively short distances. The hanging wall is marked by a persistent band of sheared, biotite schist that varies from less than 1 inch to more than 2' wide. Biotite schist can also occur elsewhere within the fault zone. A band of silicification, several inches wide, commonly marks the footwall of the fault zone at the gneiss contact. Irregular, tabular, masses of anthophyllite, from a few inches to more than 6' wide, occur within the fault zone, generally adjacent to and in the biotite schist.

The ore minerals, chalcopyrite and sphalerite, occur mainly in massive concentrations up to 6' wide along the

footwall and disseminated throughout the anthophyllite. Small amounts of sulphides occur also in narrow, discontinuous, streaks within the biotite schist and in narrow veins along some of the minor, steeply-dipping, faults and shears that split off from the main fault zone or cut across it. Flat faults are common and, in places, they have provided channelways for mineralizing solutions to migrate out into the gneiss and replace some of it with small, flat, lenses and seams of chalcopyrite and/or sphalerite.

The ore deposits have some characteristics of both replacement-type and vein-type controlled primarily by a fault zone. Although the fault zone is essentially vertical, it dips locally up to 80° either northwest or southeast. These changes in dip seem to have played a major role in localizing the ore shoots, especially in the northeast part of the mine. Here, the ore appears to be localized for the most part, along the vertical and northwest dipping segments of the fault zone. With thrust movement along the fault, the hanging wall moved up relative to the footwall thereby causing the southeast dipping segments to be tight, bearing surfaces and the vertical and northwest dipping segments dilatant areas in and through which mineralizing solutions could migrate and deposit ore. The mechanism is illustrated in Figure 3. The horizontal component of movement along the fault, although apparently much smaller than the vertical component, seems to have exerted a similar but less obvious influence in localizing the ore shoots. With right hand movement, i.e. hanging wall northeast relative to the footwall, the more northerly-striking segments became bearing surfaces and the more easterly-striking segments were opened up and mineralized. The rake of the ore shoots, in the northeast part of the mine, is estimated to be approximately 70° northeast.

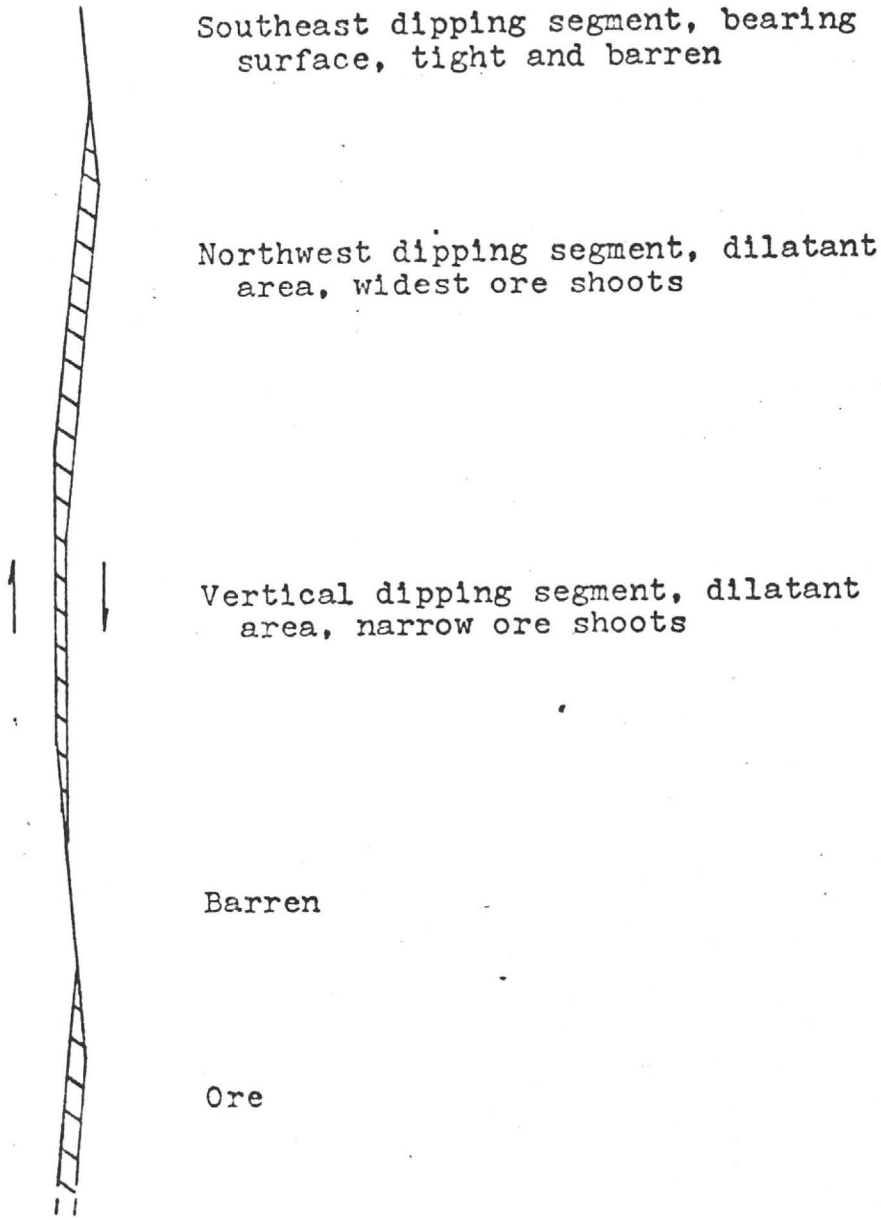


Figure 3. Illustration of ore shoot formation and control by vertical thrust movement along fault zone. Similar mechanism possibly controls ore shoots in horizontal plane.

The locus of mineralization appears to have been a relatively small, complicated, fold that plunges steeply northeast. Available assays and the location of the old mine workings between surface and the 600 level indicate that the richest and most extensive ore, probably massive sulphides, was in and immediately adjacent to the fold. The glory hole on surface is in the fold (see Figure 2) as is the high grade ore section on the 600 level (see Figure 4). Northeast and away from the locus of mineralization, the copper and zinc values of the vein diminish until finally they almost completely disappear at about the northeast end line of the Copper World Claim on the 500 level.

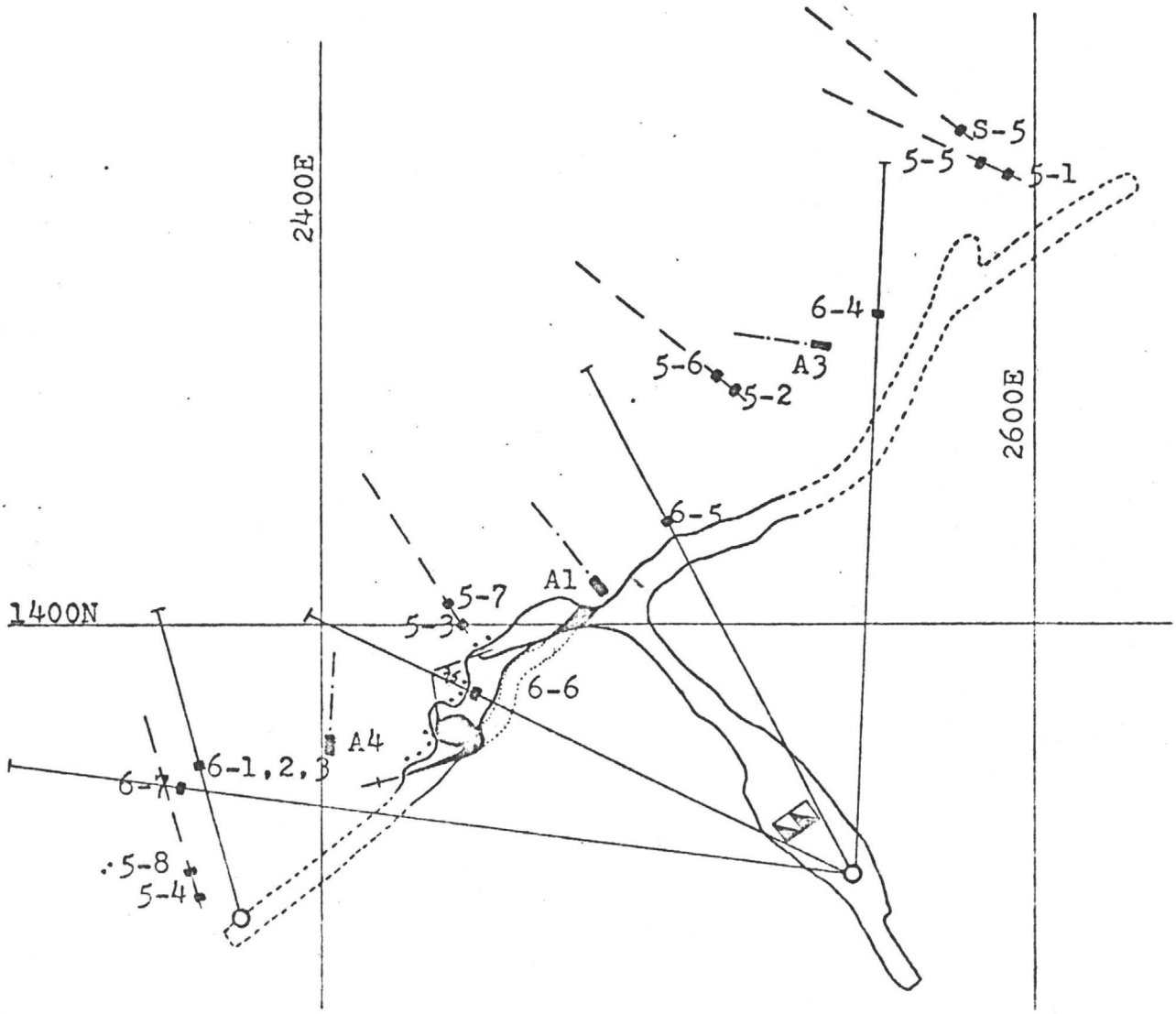
Neither the fault zone nor any vein material has been found yet southwest of the fold. Complex faulting, evident at the apparent end of the high grade ore section, has undoubtedly displaced the vein, but there is no obvious geological reason why the vein should not continue to the southwest.

GEOPHYSICS

Electromagnetic and self potential surveys were made on the property in an effort to trace the Copper World Vein beyond its present known limits. A grid consisting of a 1700-foot base line and 18 cross lines was established for survey control. The base line extended from the glory hole, on the main ore section of the vein, southwest 740' to the southwest end center marker and northeast to a point 200' beyond the northeast end line of the Copper World Claim.

EM Survey

Preliminary resistivity tests on the 500 level indicated that at least part of the Copper World Vein has electrical continuity and is a conductor. Electromagnetic or EM surveys detect conductors within the earth by



LEGEND

- Ore vein exposed
- Ore vein projected
- Mineralized fault, attitude
- Alteration, red
- A4 Existing drill hole from 500 level, vein intersection
- 5-7 Proposed drill hole from 500 level, anticipated vein intersection
- 6-4 Proposed drill hole from 600 level, anticipated vein intersection

Figure 4. Map of 600 level.

measuring properties of the secondary field they produce when energized by a primary field. The Turam method, which measures both phase angle shift and intensity ratio, gives better resolution and depth penetration than most other EM methods, and was used for the survey.

Readings were taken at a total of 178 stations spaced 50' apart on 14 cross lines along 1000' of the base line. Readings that gave questionable results were checked for validity. Curves plotted from the phase angle shift and intensity ratio values as calculated from the readings are shown on Figure 5.

The survey lines on Figure 5 are used as datum lines for the curves and, by convention, the intensity ratio and the positive phase angle shift increases above the datum. A high intensity ratio coincident with a negative phase angle shift constitutes an anomaly. The shape of the curves between 1.5N and 0.5S on line 1.5E is considered to be characteristic of an anomaly over a strong vertical conductor. The peaks of the curves are quite symmetrical and occur almost directly over the actual surface location of the vein on this line. Asymetrical curves indicate a dipping conductor.

In as much as the Copper World Vein is a conductor, and that pipe and rail on the various underground levels are also conductors, anomalies are to be expected on the lines that cross the known part of the vein. The anomalies on lines 2E and 3E are broad and not very characteristic where the vein is known to exist. This may be due to the fact that the ground wire for the primary field was laid out to work southwest from the glory hole and that these lines are somewhat beyond the northeast limits of the working area.

The last indications of the vein on surface occurs between lines 0 and 0.5N. The area beyond this is covered by overburden. However, the EM survey results indicate that a conductor, "A", which could be the extension of the

mineralized Copper World Vein, or, just a wet fault or shear zone, does continue to the southwest. The anomalies on lines 0.5W, 1W and 2W locate a strong conductor between 45' and 15' southeast of and almost parallel to the base line. Between lines 2W and 3W, the conductor appears to be offset about 110' to the northwest. Definite, but weaker, anomalies trace the conductor through lines 3W, 4W and 5W between 120' and 160' northwest of the base line. A questionable anomaly on line 6W and a weak anomaly on line 7W about 300' northwest of the base line may indicate that the conductor is again offset about 150' to the northwest, between lines 5W and 6W. The small amplitudes of the curves of the anomalies at about 3N on lines 6W and 7W could mean that the conductor is dying out or that it is at a depth approaching the limits of detection with Turam equipment.

A second conductor "B", located about 200' southeast of conductor "A" , is indicated by anomalies on lines 3W, 4W, 5W, 6W and 7W. This conductor does not appear to extend along its projected strike through any of the lines northeast of 3W, thus, it may be a branch of the stronger conductor "A".

If either conductor "A" or "B" proves to be an ore-bearing structure, additional geophysical surveys should be made southeast and southwest of the Copper World Claim.

SP Survey

Oxidizing sulphide bodies generate a natural potential and thus they can be detected by self potential or SP surveys. Copper minerals in the upper part of the Copper World Vein are undergoing oxidation as evidenced by the presence of abundant secondary copper minerals, especially in the vicinity of the glory hole.

The SP survey was made over the known part and along the projected strike of the vein for distances of 700' southwest and 1000' northeast of the glory hole. SP readings were taken at a total of 206 stations, spaced 25' and 50'

apart, on 15 cross lines. The curves plotted from the readings are shown on Figure 5.

The survey lines on Figure 5 are used as datum lines and, by convention, positive values in millivolts are plotted above the datum line and negative values below. Positive values are normal while negative values in excess of -20° mv are considered to be anomalous.

Anomalies were obtained only on three lines, 0, 0.55E and 1E, in the vicinity of the glory hole. The location of the vein is known for approximately 500' northeast of the glory hole and some oxidized copper minerals are evident along it. However, the vein apparently does not contain enough sulphides in the zone of oxidation to produce an SP anomaly. The lack of SP anomalies on the lines southwest of the glory hole indicate that there are no appreciable concentrations of oxidizing copper minerals at the bedrock surface immediately below the overburden. If the Copper World Vein does continue to the southwest, any wide ore shoots containing abundant copper minerals are probably at depth.

MINING AND EXPLORATION GUIDES

The Copper World Vein has certain mineralogical and structural features that can be used as tentative guides in mining and exploration if they are recognized.

Mineralogical Guides

1. Biotite - fine-grained to coarse-grained; brown to light brown; intensely sheared; generally occurs as a band of schist on the hanging wall but can occur elsewhere within the fault zone; distinguishable from the normal, fine-grained, black, biotite in the host gneisses by its lighter color and greater widths.

2. Anthophyllite - large, lamellar, radiating crystals; gray to brownish-gray; occurs in irregular, tabular masses only within the vein; generally adjacent to

the hanging wall biotite schist but can occur elsewhere in the fault zone; contains disseminated chalcopyrite and sphalerite and makes low grade ore.

3. Silicification - fine-grained to cherty quartz; gray to white; commonly occurs in a narrow band at the gneiss contact on the footwall.

4. Massive sulphides - high grade concentrations of chalcopyrite and sphalerite generally occur on the footwall of the fault zone.

5. Wallrock alteration - the hanging wall gneiss in the vicinity of the high grade ore shoot associated with the fold has an overall reddish-brown to pink color.

6. Sphalerite - small structures that contain sphalerite and split off from the main fault zone may lead back to the main structure some distance ahead.

7. Chalcopyrite - a mobile mineral easily moved into small fractures and openings under pressure; not considered to be too significant as a possible ore lead unless associated with sphalerite.

Structural Guides

1. Vertical - ore appears to be located on the vertical northwest dipping segments of the fault zone; southeast dipping segments are generally tight and unmineralized; turn raises into hanging wall if ore pinches out; keep raises on the footwall side of the fault zone.

2. Horizontal - ore appears to be located on the more easterly striking segments of the fault zone; the more northerly striking segments are generally tight and unmineralized; turn to the left if ore pinches out; keep headings on the footwall side of the fault zone.

3. Rake - the rake of ore shoots in the northeast section of the mine is believed to be about 70°NE but locally it may be steeper or flatter; the rake of the main ore shoot appears to be steeper, approximately 80°NE (see Figure 6).

The character and disposition of the mineralization in

the Copper World Vein will become better known as mining progresses and the validity of these tentative guides in mining and exploration will be either confirmed or disproved.

ADDITIONAL ORE POSSIBILITIES

Possibilities for additional ore exist northeast and southwest of and at depth below the present mine workings (see Figure 6). If these possibilities can be proven to be actualities by development work and drilling, the ore reserves will be substantially increased (see Table 1) and the life of the mine greatly prolonged under present economic conditions.

Northeast Possibilities

The possible ore most readily available above the 500 level is exposed in a section about 180' long on the 500 level at the extreme northeast end of the Copper World Claim. The ore shoot is believed to rake at about 70°NE and continue upwards to surface where it crops out in the vicinity of a small adit. The ore shoot could be offset by faulting or folding about 150' above the 500 level, as the main ore shoot to the southwest appears to be. The average grade of the ore as indicated by assays from the 500 level is about 1.5% Cu. and 1.5% Zn. and these values are considered representative. Assuming an average width of 4' and a tonnage factor of 10, the ore shoot could contain approximately 72 tons per vertical foot. Above the 500 level, Blocks A and A-1 could contain 11,800 and 12,200 tons of inferred ore respectively.

The ore shoot below the 500 level contains an additional 9,000 tons of inferred ore down to 4900' elevation in Block A-2. If the ore shoot does exist and has the anticipated grade and continuity through Blocks A, A-1 and A-2, it can be expected to continue downward and provide an additional 21,000 tons of projected ore in Block A-3

Table 1. Possible additional ore reserves.

Block	Tons	Category
A	11,800	Inferred
A-1	12,200	Inferred
A-2	9,000	Inferred
A-3	21,600	Projected
B	10,000	Inferred
B-1	20,000	Projected
B-2	20,000	Projected
C	5,500	Inferred
Southwest extension	?	
Total	110,100	

Note: Inferred ore - exposed or sampled on one side, assumed to continue for reasonable distances beyond either side of exposure.

Projected ore - not exposed, believed to be the continuation of inferred ore based on geological information.

between 4900' and 4600' elevation.

The ore shoot mined in the most northeasterly existing stope on the 500 level should rake about 70°NE, continue downward at least to the 600 level, and contain approximately 5,500 tons of inferred ore in Block C.

Depth Possibilities

The main, high grade, ore shoot at the southwest end of the vein has been mined and opened up by underground workings for a vertical distance of 550 feet. The ore shoot, as exposed on the 600 level and cut by drill holes about 35' above the level, appears to be just as wide, extensive and high grade as it was on the upper levels. It is believed that the ore shoot rakes about 80°NE and continues to depth without much change in either tonnage per vertical foot or total metal content. A comparison of Cu:Zn ratios from surface down to the 600 level indicates that the zinc content is possibly increasing (see Table 2) and this trend can be expected to continue with depth.

Table 2. Change of ore tenor in main ore shoot with depth.

Level	Total % Cu+Zn	Ratio %Cu:%Zn
Surface to 100	10	9:1 due probably to secondary enrichment
200	25	1:4
250	15	1:3
500	15	1:4
600	20	1:5

The ore shoot appears to be about 200' long and, with an assumed average width of 4' and a tonnage factor of 8, it would contain 100 tons per vertical foot. Below the 600 level, the ore shoot could contain 10,000 tons of inferred ore to 4800' elevation in Block B, 20,000 tons of

projected ore between 4800' and 4600' elevation in Block B-1 and 20,000 tons of projected ore between 4600' and 4400' elevation in Block B-2.

Southwest Possibilities

Geological mapping on surface and the 600 level indicates that the main, high grade, section of the vein is controlled by a complicated fold and apparently terminated by complex faulting. Exactly what has happened to the vein and where its extension could be located is not readily apparent. However, the results of the EM survey and study of the vein on the 600 level provide several leads that warrant further investigation.

The EM survey located two conductors beneath the overburden southwest of the glory hole (see Figure 2). Either of these conductors could be the mineralized southwest extension of the Copper World Vein.

A pod, or enlargement, of high grade ore is the apparent end of the main ore shoot on the 600 level. However, a tight and rather insignificant structure that contains some chalcopyrite and sphalerite continues across the back and leaves the drift in the northwest wall about 15' southwest of the pod (see Figure 4). Another small, mineralized structure also leaves the northwest wall of the drift about 20' northeast of the pod. Either of these structures may be the lead to the southwest extension of the vein. Drill hole A4 from the 500 level intersected 6' of ore 35' above and 30' due west of the pod. This intersection does not line up with the upward projection of the main ore shoot and therefore it could be on the southwest extension of the vein.

These leads must be explored for, if the southwest extension of the vein is located, it is possible that very substantial ore reserves could be proven and an entirely new section of the mine developed.

EXPLORATION

A knowledge of grade, tonnage, character and location of proven ore reserves is fundamental to the efficiency of any mining and milling operation whether it be large or small. This information can only be obtained by exploration work which should be carried out well in advance of actual mining to permit mine planning, level development and stope preparation. Diamond drilling is the fastest and most economical method of exploring for and proving ore reserves and should be utilized fully. Crosscutting, drifting and raising are often necessary to explore areas that cannot be tested effectively by diamond drilling. Although slower and more costly, well-planned exploration openings yield more information concerning the ore and provide access to it for subsequent mining operations. Both diamond drilling and underground exploration headings are required to investigate the various possibilities for additional ore at the Copper World Mine.

The ore shoot exposed in the northeast end of the 500 level drift can be investigated by exploration headings (see Figure 6). A vertical raise on the southwest side of the ore shoot between the 500 level to the 350 level should be in ore all the way and provide a working opening to mine most of Block A. The upper part of Block A can be explored by continuing the 350 level drift about 200' northeast. Block A-1 can be investigated by a raise from the most northeasterly box hole on the 350 level to surface. Block A-2 and Block C of the next ore shoot to the southwest can be explored by extending the 600 level drift about 440' northeast. The downward extensions of these ore shoots can be explored and mined from deeper levels that may be established.

Ore possibilities below the 600 level can be tested best by diamond drilling from surface and the 500 and 600

levels. Holes to probe the vein at appropriate intervals below the 600 level are listed in Table 3. The anticipated vein intersections in these holes are shown on Figures 4 and 6.

Four surface and eight underground drill holes are necessary to explore for the possible southwest extension of the Copper World Vein. The surface holes to test the EM conductors and the holes from the 500 and 600 levels to check the underground leads are listed in Table 3 and shown on Figures 2, 4 and 6. If the southwest extension of the vein is located and found to be mineralized in any of these holes, additional drilling will be necessary to determine the extent, tonnage and grade of the ore.

The total cost of the foregoing exploration work, which could increase the ore reserves by 110,100 tons or more, will be approximately $137,760. Included in this amount is the cost of 11,040 feet of diamond drilling at $9.00 per foot and the cost of 960 feet of underground development at $40.00 per foot. The exploration work can be done in phases as required to meet the demands of the presently scheduled rate of production. Or, it can be expedited and the overall potential of the mine determined within a relatively short period of time. The possible advantages of the latter course of action, which might prove the feasibility of mill expansion and increased production, deserves careful consideration under present economic conditions.

Table 3. Exploratory diamond drill holes.

Section	Hole	Collar Location	Bear.	Dip	Anticipated Intersection	Total Length	Remarks
Northeast Ore Shoot	S-6	Sur.5050'el. 2207N,2533E	S48°E	-45°	640',4600'el.	750'	Block A-3. Collar elevation estimated
Main Ore Shoot	6-4	600 level 1329N,2550E	N02°E	-27°	225',4798'el.	280'	Block B
	6-5	600 level 1329N,2550E	N28°W	-42°	150',4798'el.	215'	Block B
	6-6	600 level 1329N,2550E	N64°W	-40°	160',4798'el.	220'	Block B
	5-1	500 level 1675N,2262E	S66°E	-42°	490',4700'el.	590'	Block B-1
	5-2	500 level 1675N,2262E	S50°E	-45°	460'.4700'el.	570'	Block B-1
	5-3	500 level 1675N,2262E	S33°E	-45°	460',4700'el.	570'	Block B-1
	5-5	500 level 1675N,2262E	S66°E	-53°	600',4550'el.	730'	Block B-2
	5-6	500 level 1675N,2262E	S50°E	-56°	570',4550'el.	720'	Block B-2
	5-7	500 level 1675N,2262E	S33°E	-56°	570',4550'el.	720'	Block B-2
	S-5	Sur.5012'el. 1940N,2073E	S51°E	-46°	940',4350'el.	1070'	Block B-2
Southwest Extension	S-1	Sur.5345'el. 1.45W,2.10S 1005N,2370E	N37°W	-45°	255',5265'el.	400'	Cond. "A". Elev. est. Survey grid Mine grid

Table 3. Exploratory diamond drill holes (cont'd)

Section	Hole	Collar Location	Bear.	Dip	Anticipated Intersection	Total Length	Remarks
Southwest Extension (cont'd)	S-2	Sur.5450'el. 4.00W,2.80N 1245N,1880E	S37°E	-45°	515',5085'el.	650'	Cond. "B". Elev. est. Survey grid Mine grid
	S-3	Sur.5480'el. 4.00W,3.70N 1395N,1765E	S37°E	-45°	470',5145'el.	600'	Cond. "A". Elev. est. Survey grid Mine grid
	S-4	Sur.5460'el. 6.50W,4.20N 1210N,1595E	S37°E	-45°	515',5090'el.	675'	Cond. "B". Elev. est. Survey grid Mine grid
	5-9	500 level 1237N,2262E	N35°W	0°	100',5025'el.	150'	
	5-10	500 level 1237N,2262E	S35°E	0°	100'.5025'el.	200'	
	6-1	600 level 1318N,2377E	N15°W	+45°	65',4940'el.	125'	
	6-2	600 level 1318N,2377E	N15°W	0°	45',4900'el.	90'	
	6-3	600 level 1318N,2377E	N15°W	-45°	65',4860'el.	125'	
	6-7	600 level 1329N,2550E	N83°W	-28°	215',4798'el.	270'	
	5-4	500 level 1675N,2262E	S17°E	-42°	490',4700'el.	590'	
	5-8	500 level 1675N,2262E	S17°E	-53°	600',4550'el.	730'	
				Total		11,040'	

SUMMARY AND CONCLUSIONS

The ore deposits of the Copper World Mine have vein-type and replacement-type characteristics and are localized in and controlled by an essentially vertical thrust fault that is concordant with the gneissocity of the Precambrian host rock.

Differential vertical and horizontal movement has opened up the vertical and southwest dipping and the more easterly striking segments of the fault which localize the ore shoots. The ore shoots are believed to rake between 70° and 80° northeast.

The main economic minerals are chalcopyrite and sphalerite which have been deposited in massive and disseminated concentrations from mineralizing solutions introduced along a steeply-plunging fold. The massive sulphides occur along the footwall of the fault and the disseminated sulphides occur in irregular, tabular masses of the gangue mineral anthophyllite within the fault zone. Biotite is a prevalent gangue mineral and occurs in a band of schist along the hanging wall of the fault zone.

Certain mineralogical and structural features of the ore deposits can be used as tentative guides in mining and exploration.

The fault zone, and the mineralized material in it, is apparently terminated by complex faulting at the southwest end of the fold. EM survey results indicate that two conductors, either of which could be the continuation of the vein, extends beneath the overburden southwest of the presently known ore limits. Negative SP survey results in this area indicate that if the conductor is the continuation of the vein, any high grade concentrations of copper minerals within it are not oxidizing at surface but are probably at depth.

Possibilities for additional ore exist northeast and

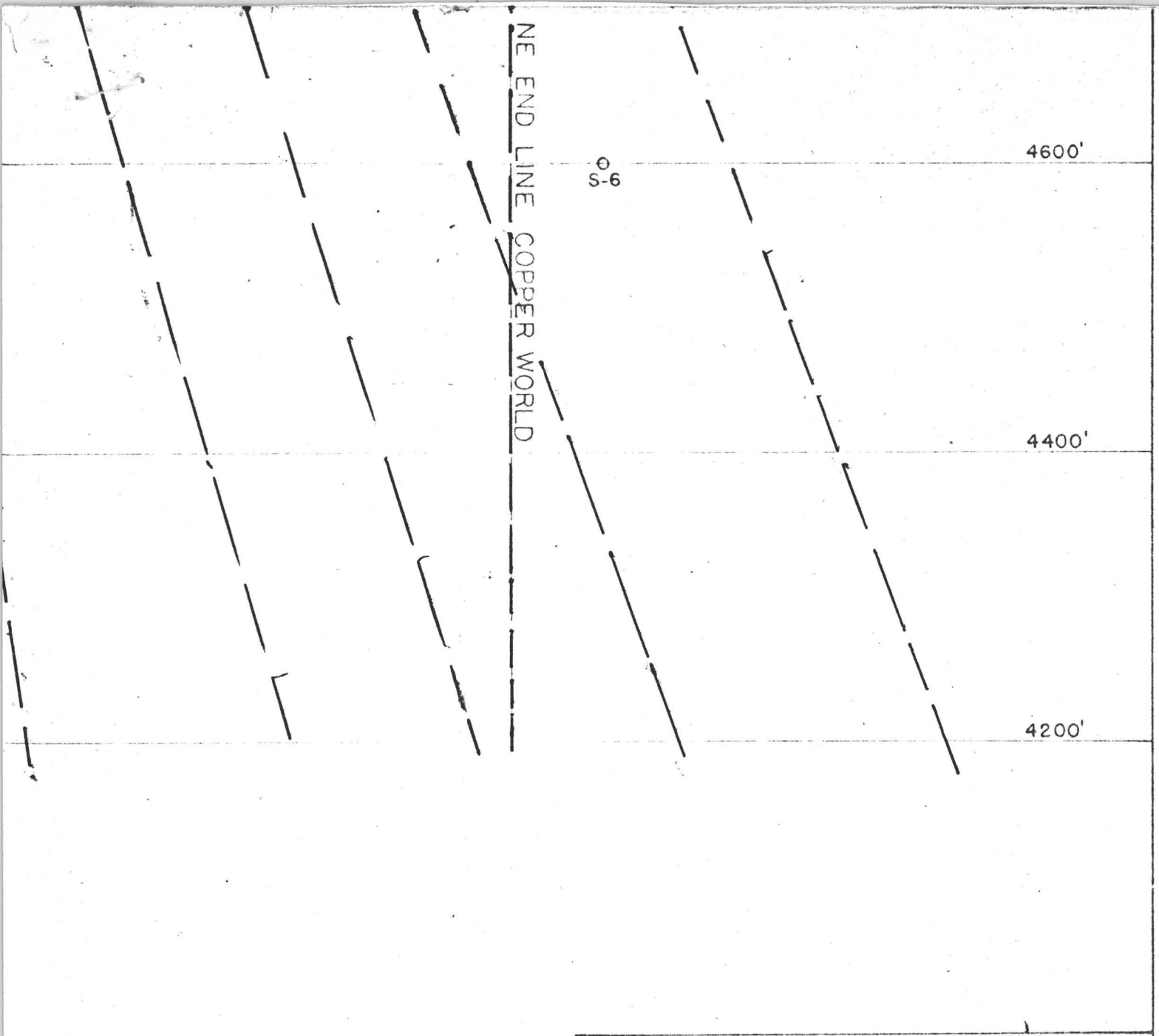
southwest of, and at depth below, the present mine workings. Diamond drilling and underground development work to explore these possibilities will cost approximately $137,760. In excess of 110,100 tons of additional ore could be located by this exploration work.

RECOMMENDATIONS

In order to explore the various possibilities for additional ore at the Copper World Mine, the proposed diamond drilling and underground development work should be done.

The company should consider the possible advantages of increased production to capitalize on the current economic conditions and decide whether or not the exploration work should be expedited to evaluate relatively quickly the overall potential of the mine.

Although the mine is small, the geology is not simple and a competent mine geologist should be employed to do the work connected with exploration drilling and development, production, and general mine engineering.



STANDARD COPPER CORPORATION

LONGITUDINAL SECTION

OF

COPPER WORLD MINE

S25, T18N, R16W

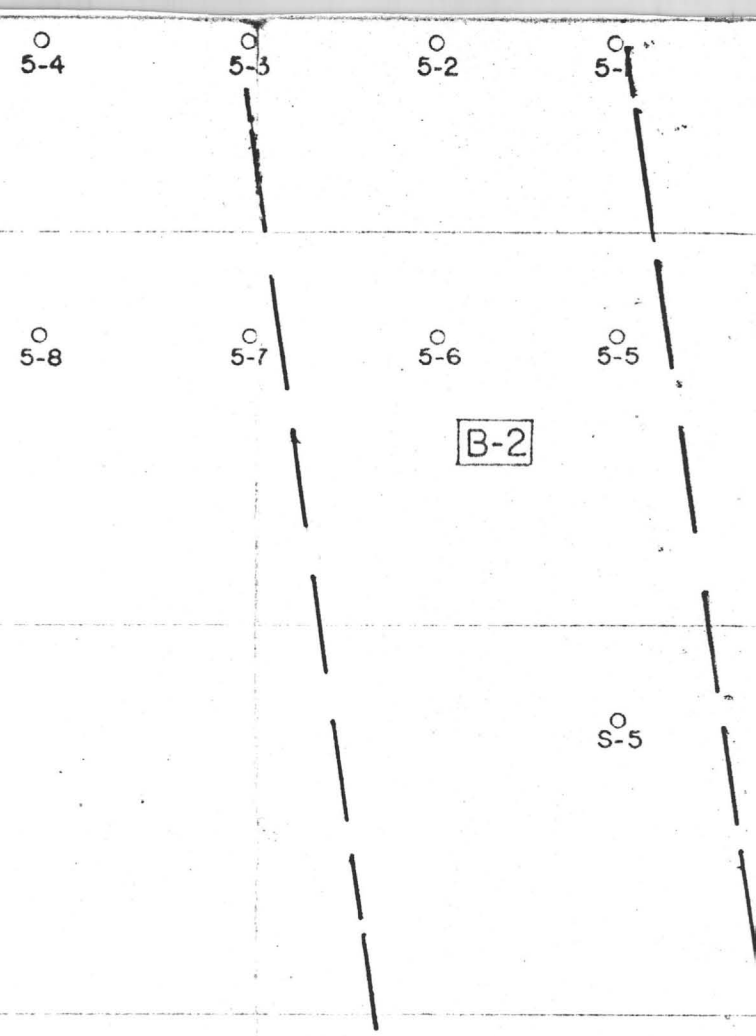
MOHAVE COUNTY, ARIZONA

SCALE 1" = 100'

JFBS

15 AUG. '66

FIGURE



LEGEND

EXISTING STOPES

EXISTING HEADINGS

PROPOSED HEADINGS

A4 EXISTING DRILL HOLES

6-1 PROPOSED DRILL HOLES

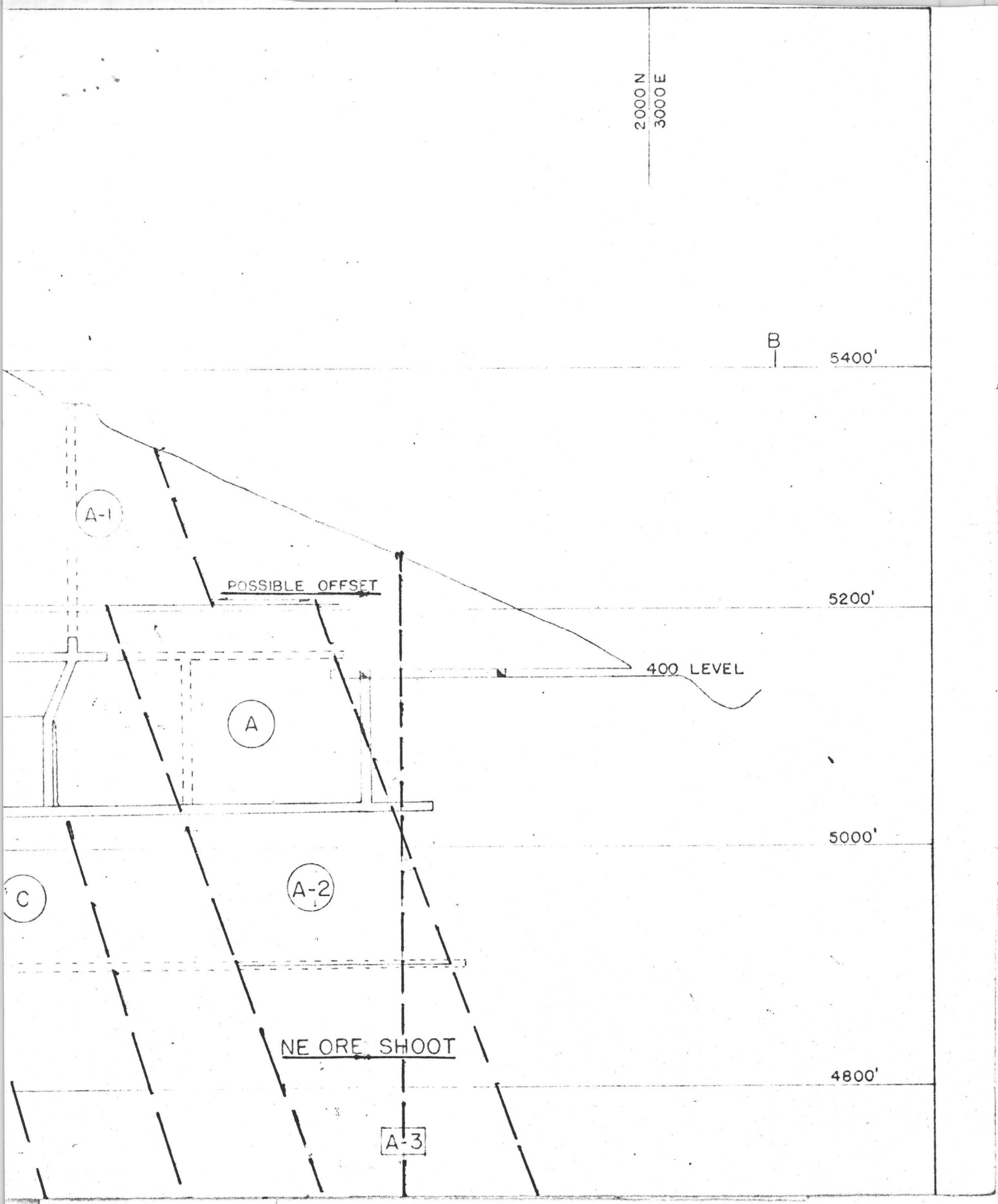
ASSUMED ORE SHOOT LIMITS

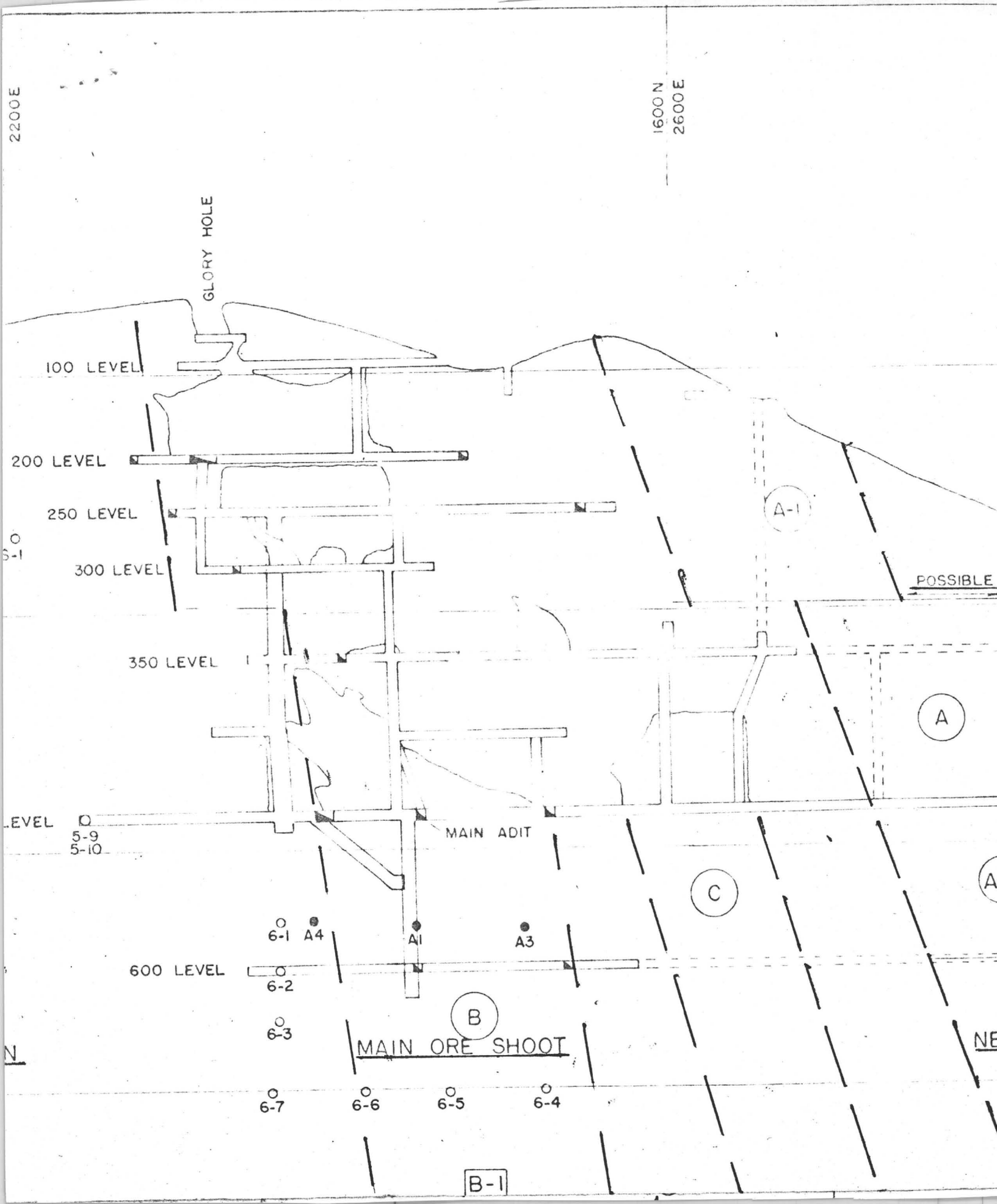
A INFERRED ORE BLOCKS

A-2 PROJECTED ORE BLOCKS

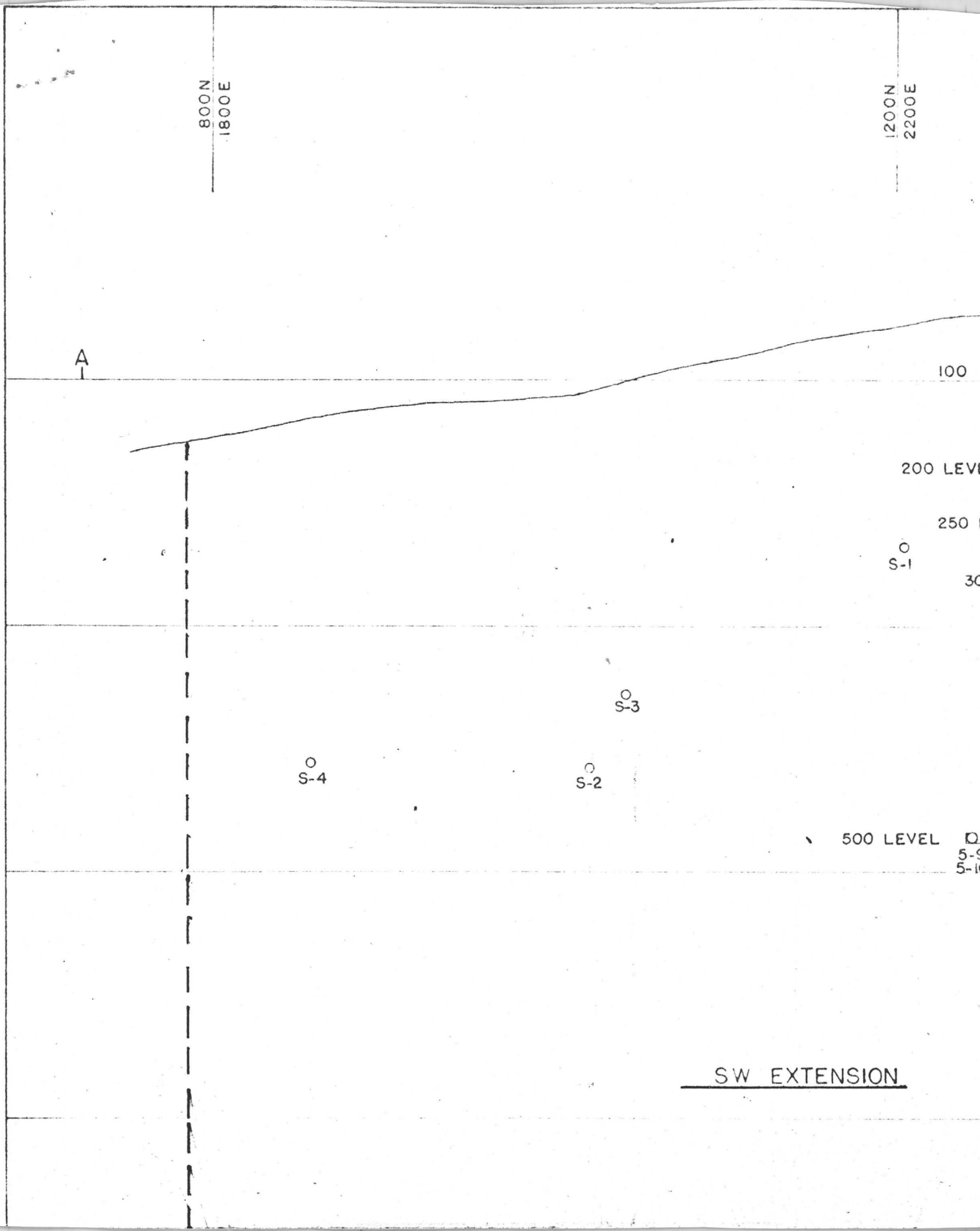
NOTES
1. PLANE OF SECTION N 45°E, LOOKING NORTHWEST
2. LOCATION OF WORKINGS FROM J. D. FORRESTER REPORT, 1963

SW END LINE COPPER WORLD


2000 N
3000 E
B
5400'
A-1
POSSIBLE OFFSET
5200'
400 LEVEL
A
5000'
C
A-2
NE ORE SHOOT
4800'
A-3


2200E
1600 N
2600E
GLORY HOLE
100 LEVEL
200 LEVEL
250 LEVEL
300 LEVEL
350 LEVEL
LEVEL
5-9
5-10
MAIN ADIT
600 LEVEL
6-1
A4
A1
A3
6-2
6-3
6-7
6-6
6-5
6-4
B
MAIN ORE SHOOT
C
A-1
A
POSSIBLE
NE
N

B-1


800N
1800E
1200N
2200E
A
100
200 LEVE
250
S-1
30
S-3
S-4
S-2
500 LEVEL
SW EXTENSION

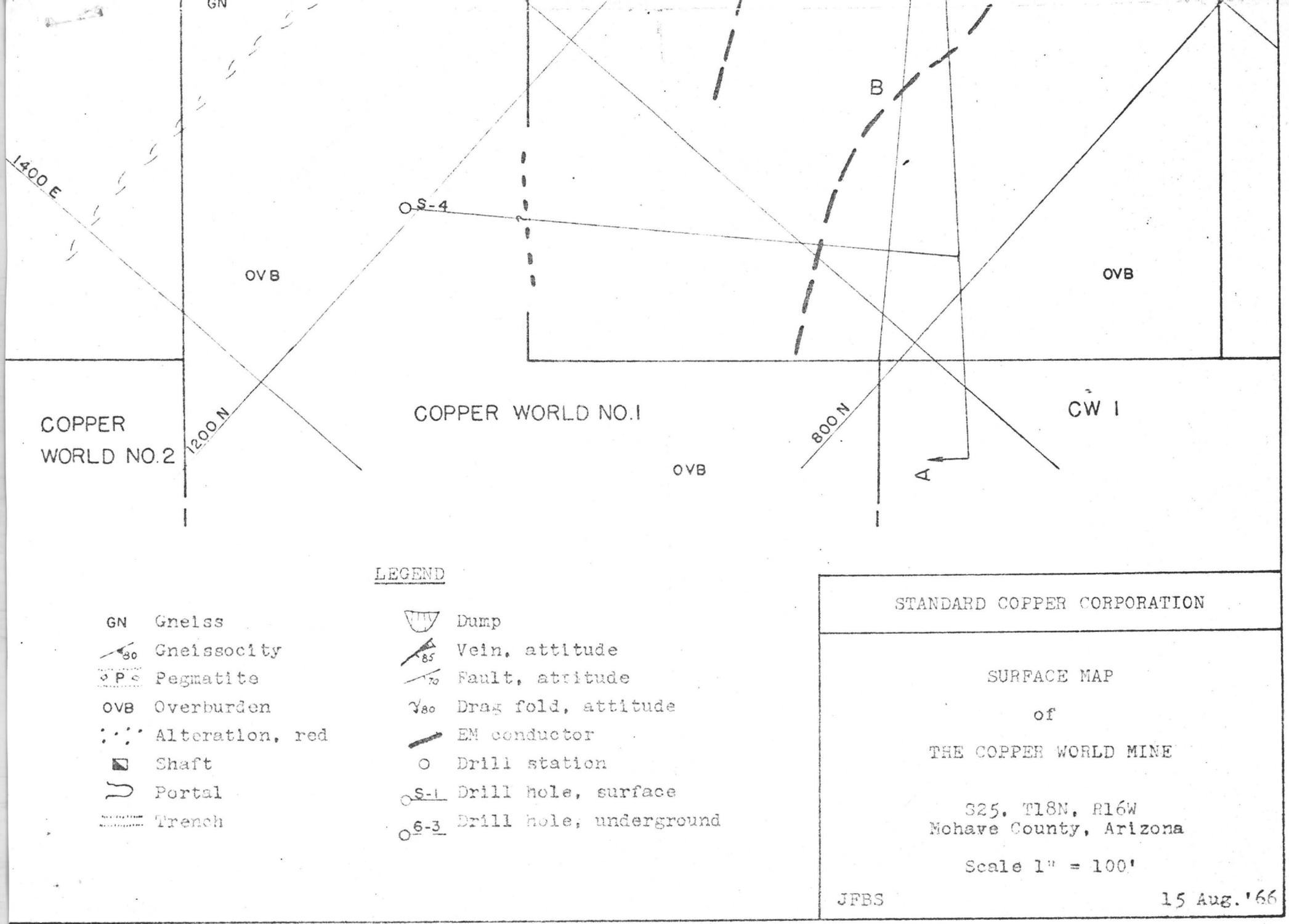
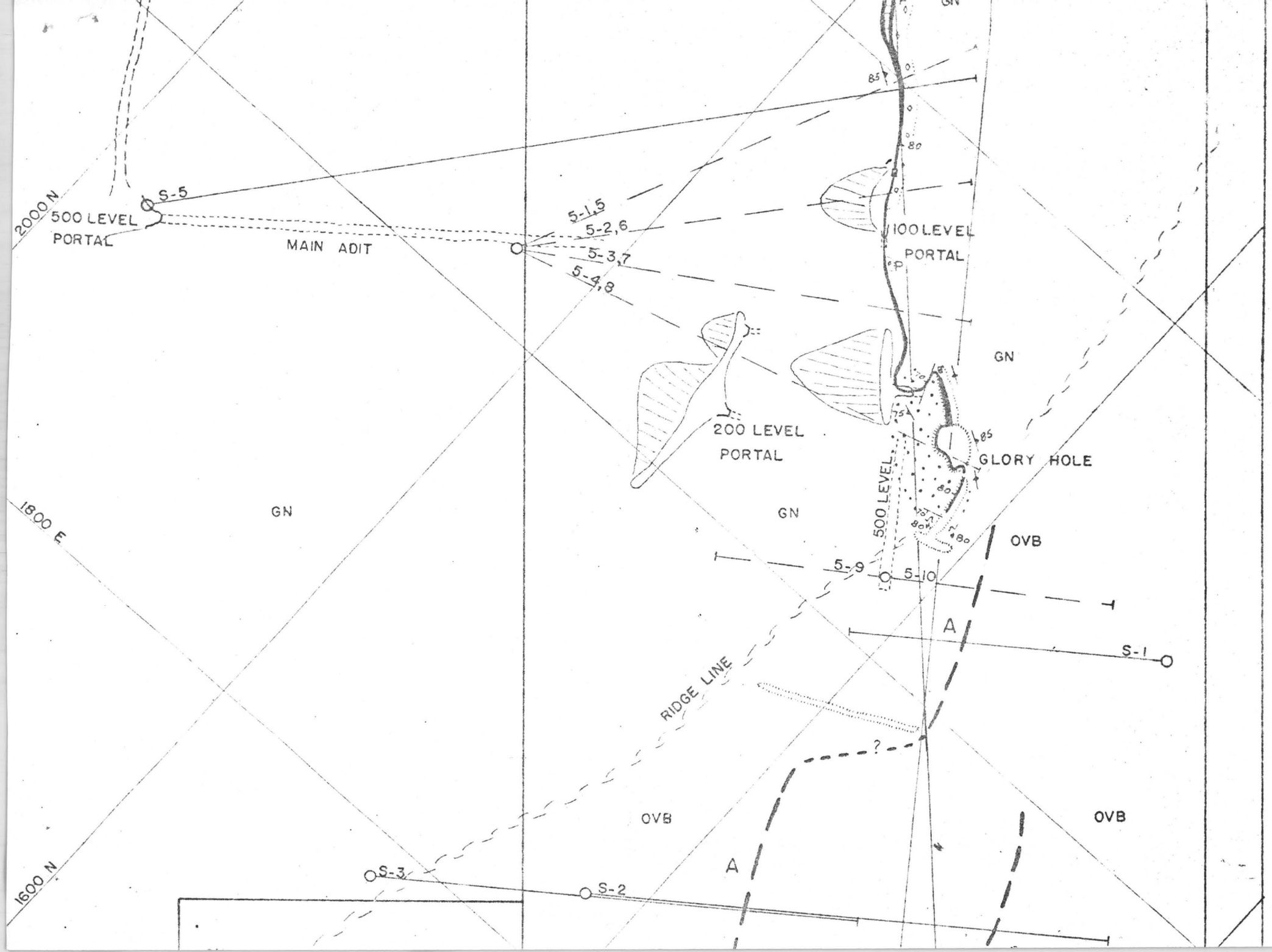
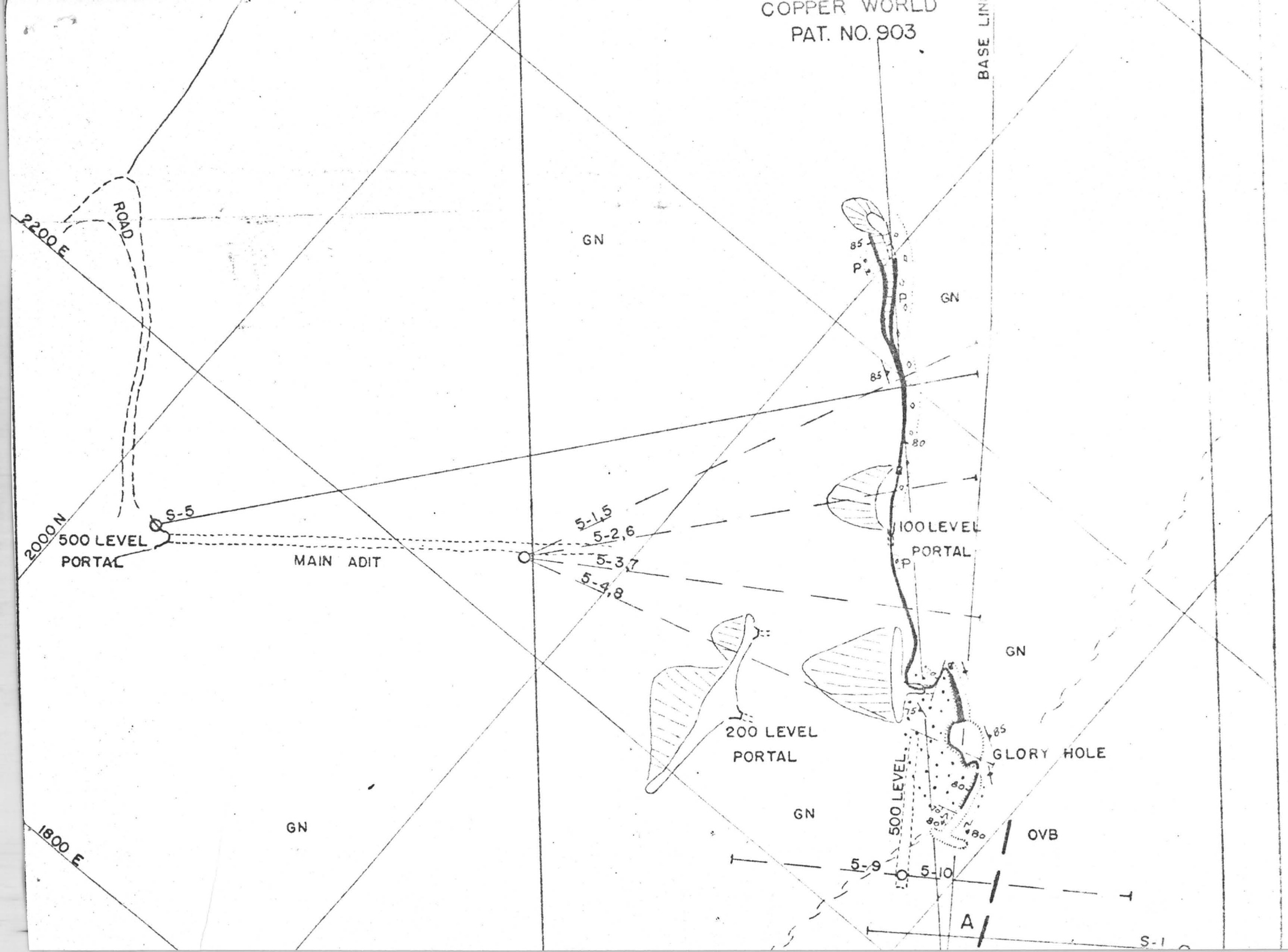
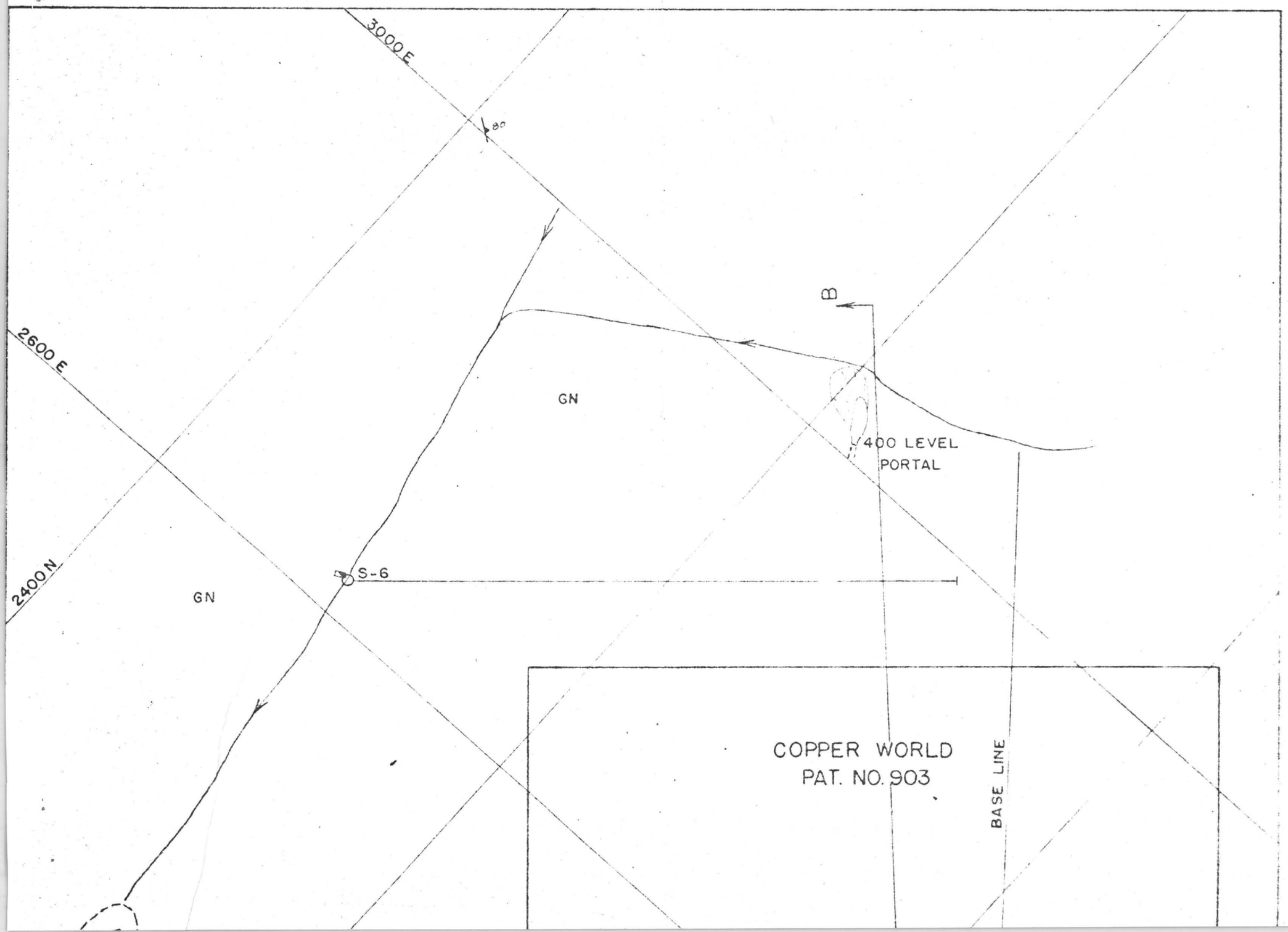
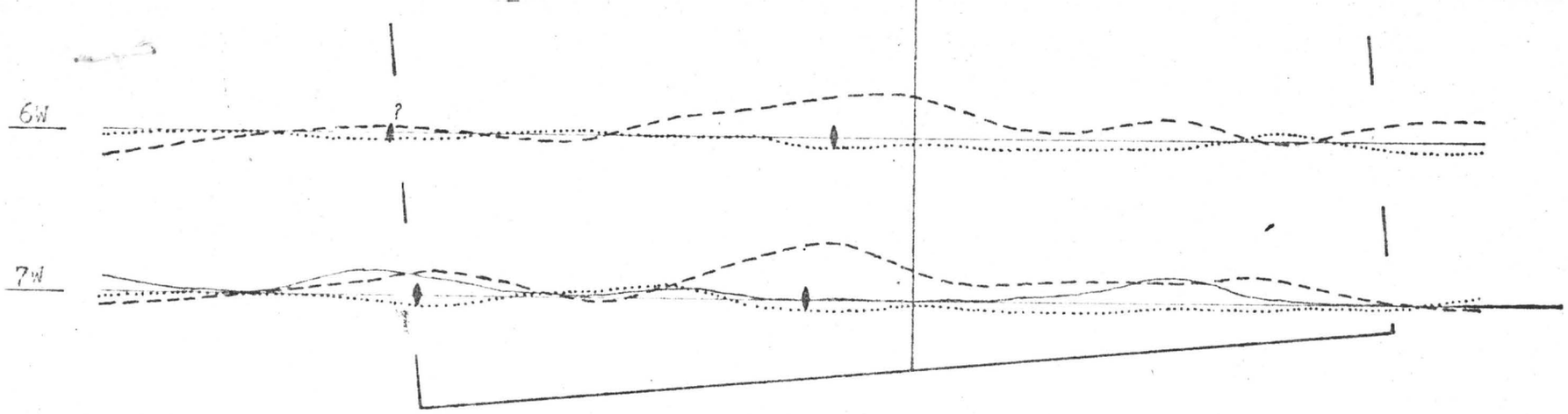

GN
B
1400 E
S-4
OVB
OVB
COPPER
WORLD NO.2
1200 N
COPPER WORLD NO.1
800 N
OVB
A
CW 1
LEGEND
GN Gneiss
80 Gneissocity
P Pegmatite
OVB Overburden
Alteration, red
Shaft
Portal
Trench
Dump
85 Vein, attitude
70 Fault, attitude
80 Drag fold, attitude
EM conductor
Drill station
S-1 Drill hole, surface
6-3 Drill hole, underground
STANDARD COPPER CORPORATION
SURFACE MAP
of
THE COPPER WORLD MINE
S25, T18N, R16W
Mohave County, Arizona
Scale 1" = 100'
JFBS
15 Aug.'66

FIGURE 2


2000 N
1800 E
1600 N
S-5
500 LEVEL
PORTAL
MAIN ADIT
5-1,5
5-2,6
5-3,7
5-4,8
100 LEVEL
PORTAL
200 LEVEL
PORTAL
500 LEVEL
GLORY HOLE
GN
GN
GN
OVB
OVB
OVB
5-9
5-10
S-1
S-2
S-3
A
A
RIDGE LINE
?


COPPER WORLD
PAT. NO. 903
BASE LINE
ROAD
2200 E
2000 N
1800 E
GN
GN
GN
GN
S-5
500 LEVEL
PORTAL
MAIN ADIT
5-1,5
5-2,6
5-3,7
5-4,8
100 LEVEL
PORTAL
200 LEVEL
PORTAL
500 LEVEL
GLORY HOLE
OVB
5-9
5-10
A
S-1


3000 E
80
2600 E
2400 N
GN
GN
B
400 LEVEL
PORTAL
S-6
COPPER WORLD
PAT. NO. 903
BASE LINE



LEGEND

- Claim boundary
- 7W Survey and datum line
- SP potential profile
- SP anomaly
- EM intensity ratio profile
- EM phase angle shift profile
- EM conductor

SCALES

SP Profile Pot.	EM Profiles Int. Ratio	EM Profiles Ph. Ang. Sh.
+50mv	1.200	+10°
0	1.100	0
-50mv	1.000	-10°

STANDARD COPPER CORPORATION

Map Showing Results
of

SP AND EM SURVEYS

at

THE COPPER WORLD MINE

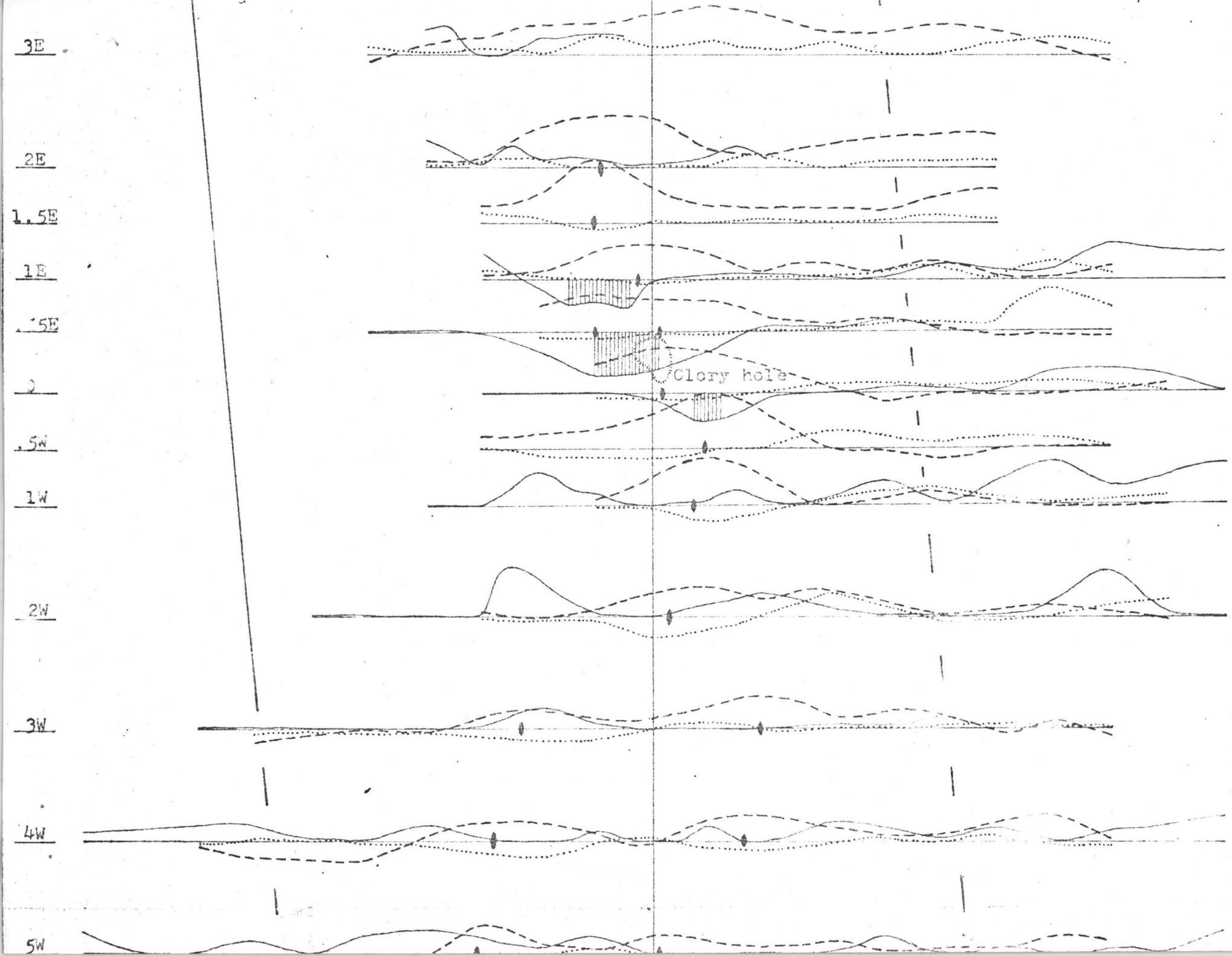
S25, T18N, R16W
Mohave County, Arizona

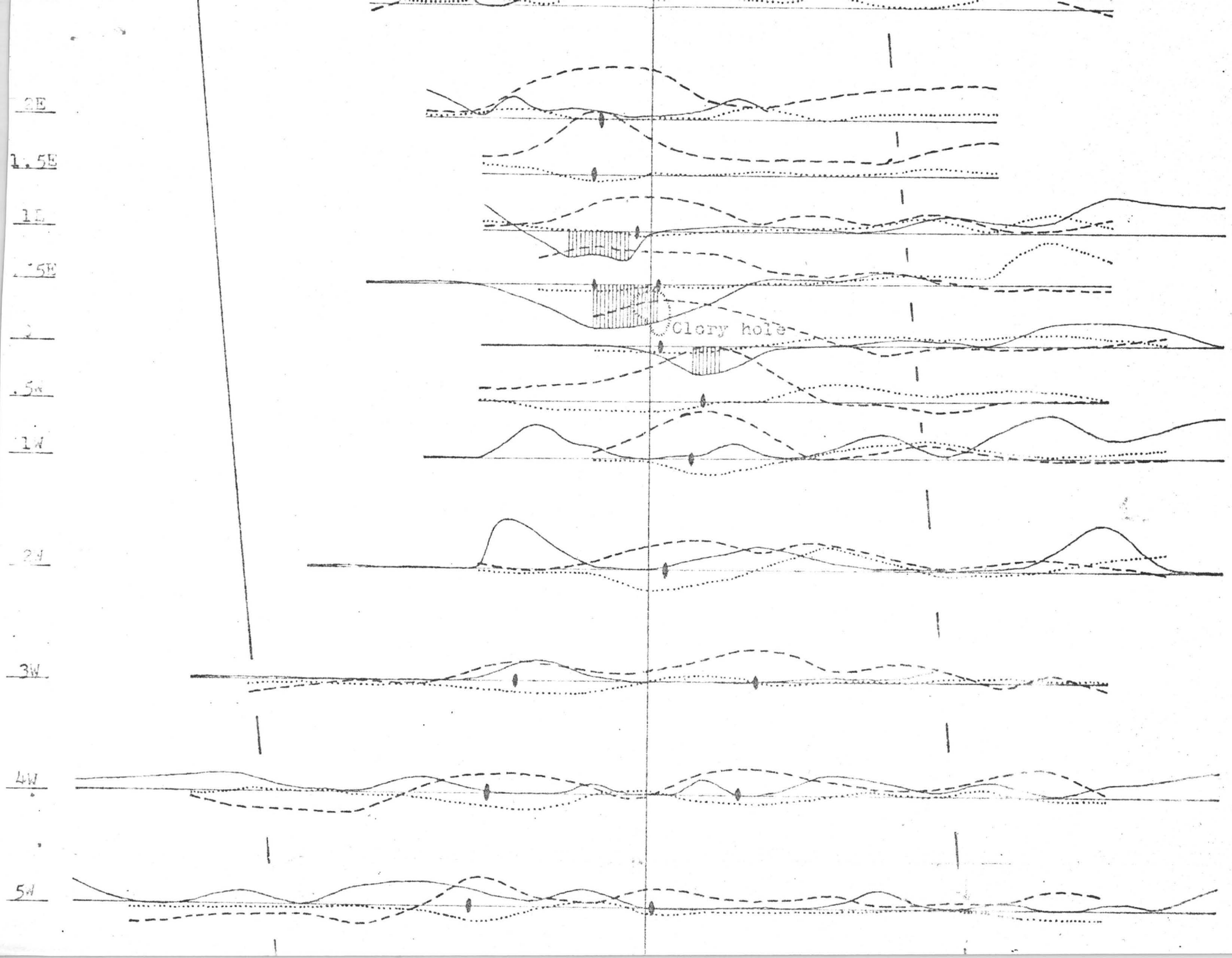
Scale 1" = 100'

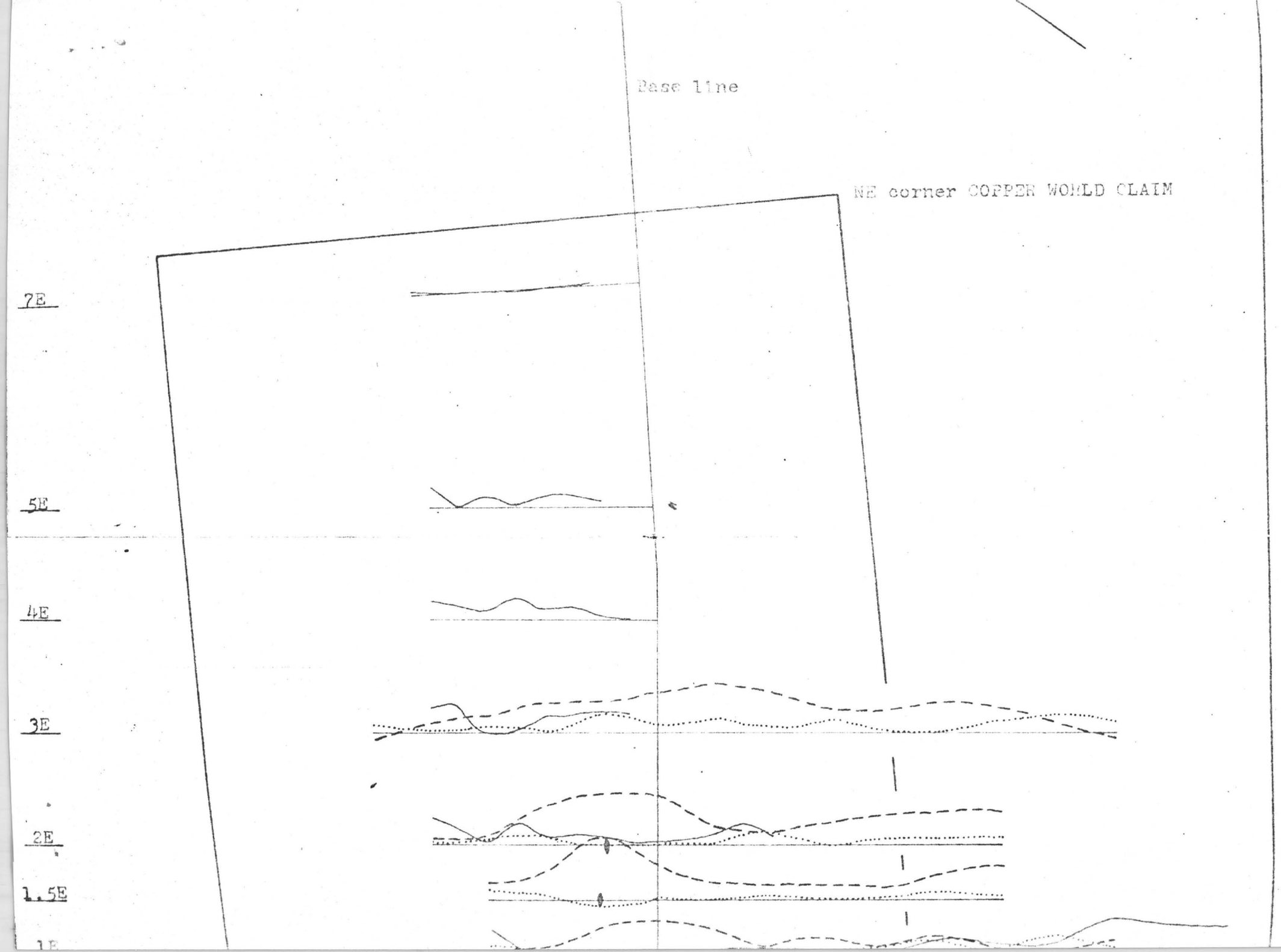
JFBS

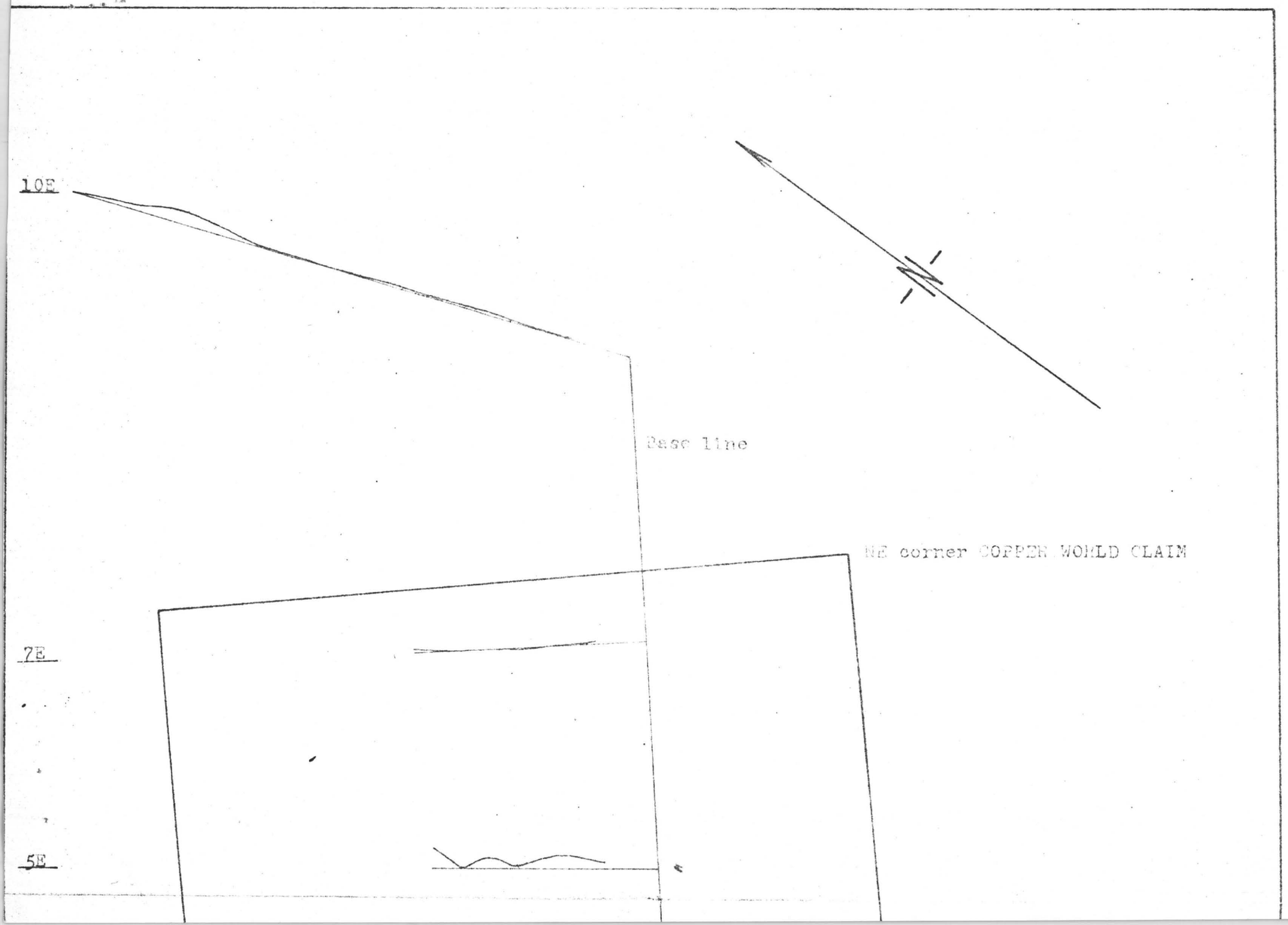
15 Aug.'66

FIGURE 5


3E
2E
1.5E
1E
.5E
0
.5W
1W
2W
3W
4W
5W
Clory hole


2E
1.5E
1E
.5E
.5W
1W
2W
3W
4W
5W
Clory hole


Base line
NE corner COPPER WORLD CLAIM
7E
5E
4E
3E
2E
1.5E
1E


10E
Base line
NE corner COPPER WORLD CLAIM
7E
5E

RECEIVED
3 1970
STANDARD METALS CORPORATION
SILVERTON, COLO.

GEOLOGIC EVALUATION

of

THE COPPER WORLD MINE

June 2, 1970

By
Allan G. Bird
Manager of Exploration

GEOLOGIC EVALUATION
OF
THE COPPER WORLD MINE

INTRODUCTION:

The Copper World mine was visited on May 7, 1970. Diamond drill hole CW-3 (Boyles Bros.) cut 25 feet of good copper mineralization directly below the 7th level stope. Hole CW-1 was barren and hole CW-2 was lost about 20 feet short of the target area.

Current operations include pulling of broken material from the 6th level stope and stoping in the 7th level stope.

GEOLOGY:

The massive sulfide mineralization in the Copper World mine is similar in appearance to the Antler mine ore; however, the primary gangue mineral is pyrite, not pyrrhotite. The ore-bearing structures dip steeply (80 - 90 degrees) and have a general appearance more consistent with a true fissure vein. The walls are composed of granitic gneisses and quartz-biotite schists. Wall rock alteration varies from place to place in the mine. The 6th level stope was characterized by an envelope of soft green chlorite which resulted in excessive dilution of the ore. The 7th level stope does not have any appreciable chlorite.

A small ore body has been drilled between the 5th and 6th levels. This area is on the hanging wall side of the

fault which cuts through the raise at the northeast end of the 6th level main stope. Rough estimates of about 3,100 tons are indicated in this area.

DIAMOND DRILLING:

Two of three planned holes were completed. Hole CW-2 twisted off a bit and some rods in the hole and had to be abandoned. Hole CW-1 cut the ore-bearing structure about 135 feet below the 7th level track, directly below the bottom of the 7th level winze. No mineral was cut in this hole. Hole CW-3 cut 25 feet of 4% Copper and 3.2% Zinc. Actual values will be higher since the sampler did not sample the core between 185-190 feet and between 201-204 feet. This core contained visible chalcopyrite and instructions have been given to sample these zones. The 25 foot zone (only 17 feet sampled) represents a true vein width of approximately 15 feet. This ore extends from 45 to 65 feet vertically below the 7th level track about 40 feet northeast of the center of the 7th level winze (see enclosed sketch). Hole CW-2, which was lost, was designed to test the area below the 6th level stope to determine if the mineralization extended downward. This area remains untested.

CONCLUSIONS AND RECOMMENDATIONS:

1. At the present time, ten men are employed at the Copper World, producing about 3 tons per man shift. This

crew should be cut to a maximum of five men if any money is to be made from this project.

2. The material being pulled from the 6th level stope appears to be waste. Samples should be taken before this is shipped from the mine. The ore from the 7th level stope appears to be high grade; however, the mixed ores are giving an average mill head which suggests that the 7th level ore is being badly diluted by this material from the 6th level stope.

3. Since the underground physical facilities are extremely awkward, i.e., ore must be dumped on the sill of the 7th level, slushed into a small bucket, hoisted to the 6th level, dumped into a bin, pulled from the bin into 1 ton cars, trammed to the main shaft, hoisted in the car to the 5th level and trammed out the tunnel to the surface bin where it is crushed prior to trucking to the mill. A good hard look should be taken to determine if the value of the anticipated ore can justify these heavy costs.

4. The royalty arrangement with the University of Arizona is based on an 80% mill recovery which must produce a 24% copper concentrate. Actual grade for the month of April, 1970 was 21.8% copper from a 62.56% copper recovery. Since we must pay $1,000 a month royalty, we must produce at least $10,000

per month net smelter to cover the minimum royalty.

A detailed engineering study should be made to establish minimum tonnages and grades necessary to make the Copper World economic.

5. If feasibility studies indicate the advisability of additional expenditures at the Copper World, additional drilling should be done to determine if enough ore exists below the 7th level to justify sinking the main shaft from the 6th level to the 8th level, (100 feet below the 7th level).

6. A more detailed sampling program should be followed to closely evaluate the material currently being shipped to the mill.

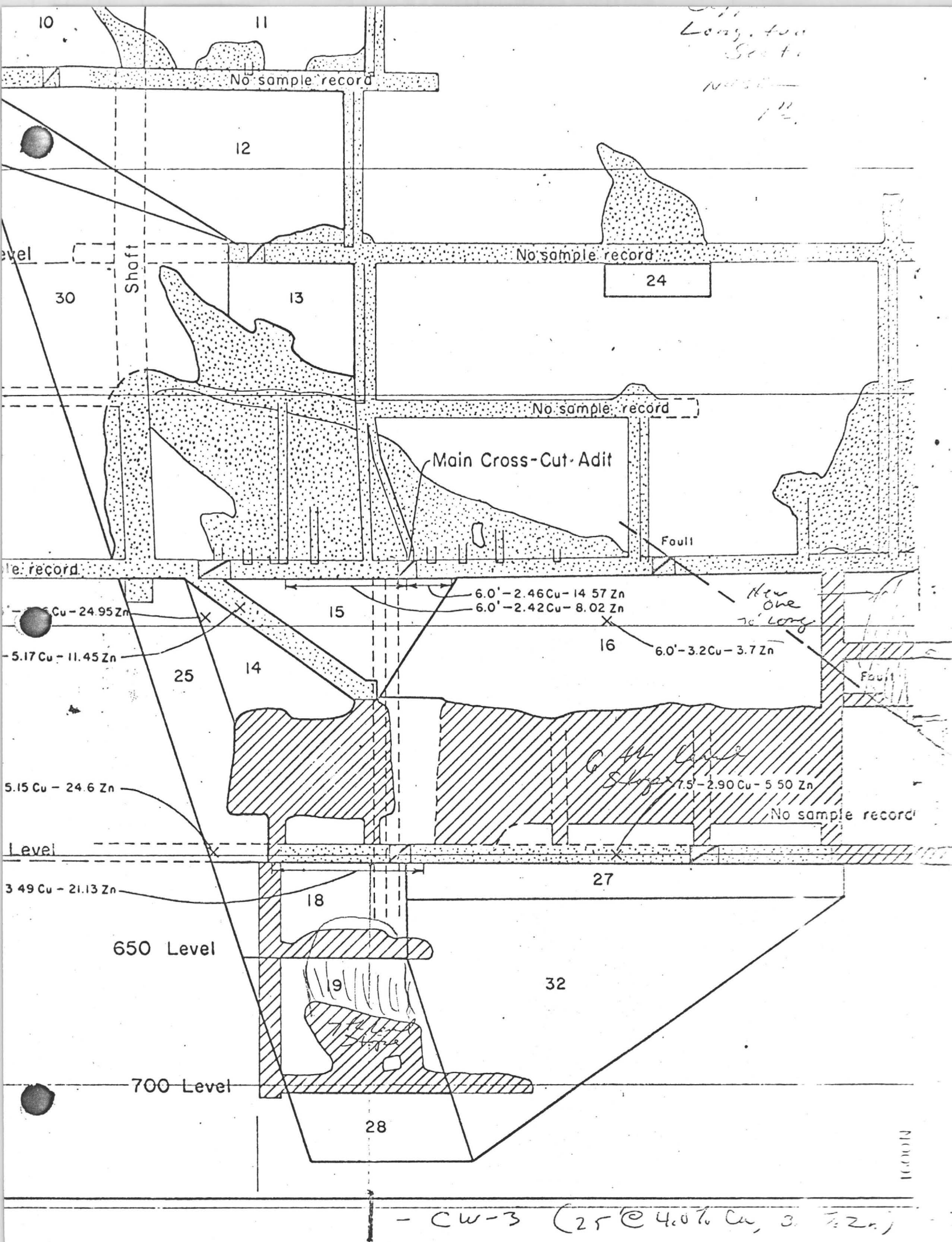
Very truly yours,

Allan G. Bird

Allan G. Bird
Manager of Exploration

AGB:pjd .

Enclosure



- CW-3 (25 @ 4.0% Cu, 3.[illegible]% Zn)

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

Yucca, Arizona 5-5-70

MINE C. Wold Bowles Bros.

NO.	DESCRIPTION	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
201	DDH #3 182 185	omitted.		0.20	5.7	16.9	12.6				
202	✓ 185-190 190-195			0.25	2.8	1.0	5.4				
203	✓ 195-199			0.20	9.0	1.1	14.6				
204	✓ 199-201	omitted		0.30	7.6	3.1	12.0				
205	✓ 201-204 204-206½			0.25	4.8	4.8	30.4				
071	STOPE.			0.15	3.4	20.4	11.2				

Assayer

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

MINE [illegible] Boyles Bros. Yucca, Arizona 5-5-70

NO.	DESCRIPTION Boyles Bros.	Ozs. Per 2000 Lbs. Gold	Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
1201	DDH #3 ~~185~~ 182	183' to 185'		0.20	5.7	16.9	12.6				
1202	✓ ~~190-195~~	192' to 195'		0.25	2.8	1.0	5.4				
1203	✓ ~~195-199~~	195' to 198'		0.20	9.0	1.1	14.6				
1204	✓ ~~199-201~~	198' to 200'		0.30	7.6	3.1	12.0				
1205	✓ 204-206½			0.25	4.8	4.8	30.4				
0 71	STOPE.			0.15	3.4	20.4	11.2				
1209	Car Grab Sample #2 stope 6th Level at drift elevation Antler Mine										
~~1210~~	~~DDH #1 Antler Mine 141 ft to 145 ft 1.5 Pb, 5.0% Cu, 12.7 Zn~~										
1211	DDH 3 Co World 185 ft to 192 ft						.3 Pb	.4 Cu	1.0 Zn	2.4 Fe	
1212	DDH 3 Co World 200 ft to 204 ft						.2 Pb	.2 Cu	1.5 Zn	4.2 Fe	

[illegible]
Assayer

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

CONTRA WORLD LOT # 6
COMPOSITES

Yucca, Arizona AUG 1970

NO.	DESCRIPTION	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
	HEADS.	-		0.4	3.4	12.7	15.0				
	Zn CONC.	-		0.2	0.5	48.2	-				
	Cu CONC.	-		0.2	22.8	10.5	-				
	C. CONC	-		14.3	7.7	8.4	-				
	TAILS	-		0.1	0.2	5.4	9.6				

158.39 Wet Tons (Final One
From 7th Level and also from Mine

AB

Receipt

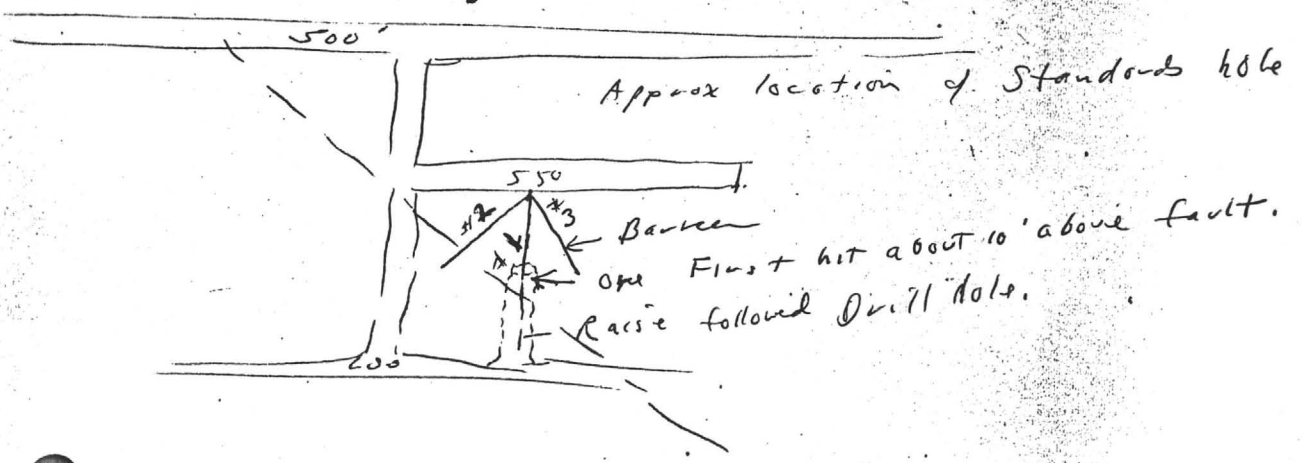
STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

Mine - Copper World Yucca, Arizona 1-3-20

NO.	DESCRIPTION	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent
1052	Standards DDH #2 23½-25½			0.40	3.5	14.8	6.7			
1056	" 37-39½			0.40	8.0	16.8	14.7			
1055	" 43½-47			0.40	4.2	1.2	8.1			

O.D.H #2 Standards -
This hole was drilled from the 550' Sublevel. Drill was set up in the sublevel and drilled down dip on the vein.



STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

Yucca, Arizona 3-28-7

NO.	DESCRIPTION Standards	Ozs. Per 2000 Lbs. Gold	Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
1083	20'-#2 25'-2	1½		0.40	5.4	30.4					
1084	" 28'-30			0.40	6.5	6.5		Drilled		from	
1085	" 33'-37'			0.20	4.9	7.5		550'		Sublevel	
1087	" 39½-43½			0.30	6.9	5.3					

* Not to be confused with Boyle Bros hole #2 Drilled below the 6th level.

Assayer

STANDARD METALS CORPORATION

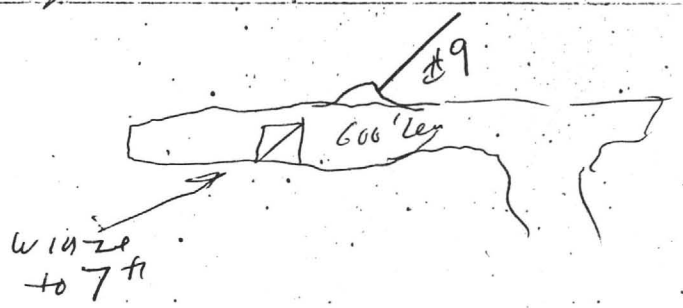
CERTIFICATE OF ASSAY

Yucca, Arizona

COPPER WORLD. WEST 600 DRIFT 2-12-70

NO.	DESCRIPTION	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
-16'	LONG HOLE #9			0.50	0.30	1.1					
'-29'	—		—	0.40	TR	0.40					
'-40'	—		—	0.40	TR	0.40					

Holes marked with Red paint -



STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

COPPER World — Yucca, Arizona — 8-29-70

NO.	DESCRIPTION Standard	Ozs. Per 2000 Lbs. Gold	Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
267	DDH#1 13'-17'			0.50	5.5	26.5					
268	" 17'-19'			0.40	4.7	22.6					
269	DDH#2 14½'-16'			0.30	1.9	2.4					

Drilled from 550 Sublevel

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

Yucca, Arizona

COPPER WORLD. WEST 600 DRIFT 2-12-70

NO.	DESCRIPTION	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent
-16'	LONG HOLE #9			0.50	0.30	1.1				
'-29'	" "			0.40	TR	0.40				
'-40'	" "			0.40	TR	0.40				

Holes marked with red paint -

Assayer

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

Yucca, Arizona 3-23-70

NO.	DESCRIPTION	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
	Standards										
1068	DDH #1 68'-70'			0.20	6.3	34.9					
1069	— 19'-23'			0.20	3.9	7.3					
1072	— 26'-28'			0.30	7.1	8.3					
1073	— 28'-30'			0.30	8.0	4.2					
1074	— 30'-33½'			0.20	5.6	2.2					
1075	— 33½'-36½'			0.20	7.0	3.1					

Drilled Down Dip on Vein from 550' Sublevel

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

Yucca, Arizona

Copper World

NO.	DESCRIPTION Standards	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
20	DDH 1 16'-21'			1.0	5.6	17.8	12.0				
21	" 21'-23½'			0.60	6.8	24.0	12.0				

Assayer

Drilled Down dip on vein from 550 Sublevel,

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

MINE - COPPER WORLD Yucca, Arizona 3-26-70

NO.	DESCRIPTION Standards	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent
064	DDH #1, 8'-10'			0.40	0.10	0.30				
065	" " 10'-11'4"			0.50	5.5	19.5				
066	" " 11'4"-13'			0.40	0.20	1.2				
070	" " 20'-22'			0.50	6.2	20.7				
071	" " 22'-26'			0.40	7.2	6.0				

Assayer

Drilled Down dip on Vein from 550' Sublevel.

STANDARD METALS CORPORATION

CERTIFICATE OF ASSAY

ORDER No/Sp/D

Yucca, Arizona 3-29-70

NO.	DESCRIPTION Standards	Ozs. Per 2000 Lbs. Gold	Ozs. Per 2000 Lbs. Silver	Per Cent Lead	Per Cent Copper	Per Cent Zinc	Per Cent Iron	Per Cent Insoluble	Per Cent	Per Cent	Remarks
1067	DDH#1 13'-17'			0.50	5.5	26.5					
1068	" 17'-19'			0.40	4.7	22.6					
1069	DDH#2 14½'-16'			0.30	1.9	2.4					

Drilled from 550 Sublevel

phelps dodge Corporation Western Exploration Office, Drawer 1217, Douglas, Arizona 85607 • (602) 364-8414

July 12, 1974

Mr. Steve E. Tima
Tima Oil & Mining Company, Inc.
2242 E. Lincoln Dr.
Phoenix, Arizona 85016

Dear Mr. Tima:

Enclosed are the laboratory analyses of samples taken of your Copper World Mine, Mohave County, Arizona, during my recent visit.

Sincerely yours,

H. S. Jacobson
Senior Geologist

HSJ: s

Enclosures

300 Park Avenue, New York, N. Y. 10022 • (212) 751-3200

CARLOS ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. No. 7126

HECTOR C. ROCHIN SR.
FOUNDER
REGISTERED ASSAYER
ARIZONA REG. No. 4073

HECTOR A. ROCHIN JR.
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2473

LOCATION: Arizona
500 Lu. M16 AJ

Rochin Assay Office, Inc.

P. O. BOX 1323 PHONE (AC 602) 364-8092
DOUGLAS, ARIZONA - 85607

ASSAYERS & METALLURGICAL CHEMISTS

CERTIFICATE OF ASSAY

Name Western Exploration Office Drawer 1217 Douglas, Arizona 85607

Attn: H. Jacobson		GOLD OZS.	SILVER OZS.	COPPER %	LEAD %	ZINC %				
34345	13472	0.01	2.10	0.13		2.88	500 LW.	M16	AJ	
34346	13473	0.02	2.16	0.45		0.67	"	M16	Bj	
34347	13474	0.02	11.36	4.47		19.39	"	M17	J	

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ARIZONA REG. No. 4073

HECTOR A. ROCHIN JR.
MINING ENGINEER AND
LAND SURVEYOR
ARIZONA REG. No. 2473

LOCATION: Copper World Mine
Arizona
T18R16Sec25
Quad 176

Rochin Assay Office, Inc.

P. O. BOX 1323 PHONE (AC 602) 364-8092
DOUGLAS, ARIZONA - 85607

ASSAYERS & METALLURGICAL CHEMISTS

CERTIFICATE OF ASSAY

Name Western Exploration Office Drawer 1217 Douglas, Arizona 85607

Attn: H. Jacobson		GOLD OZS.	SILVER OZS.	COPPER %	LEAD %	ZINC %			
34286	13469	Tr	3.00		0.55	2.98		5 AJ	3 Dump
34287	13470	Tr	0.40		0.41	21.03		5 BJ	

REGISTERED ASSAYER CERTIFICATE 7126 CARLOS ROCHIN Tucson U.S.A.

REMARKS:

DATE: June 29, 1974

CHARGES: $21.00

6-24-74

GEOCHEMICAL ANALYSIS

Date Received 6-18-74

Location Copper World Mine 176 Ariz.

Em. Spec. ..... X-Ray ..... Chem. .....

Geologist HSJ

Pulp No.	SAMPLE NUMBER T. R. S. IDENT.	Mo P.P.M.		Pb P.P.M.		Zn P.P.M.		Cu P.P.M.		Ag OZ/TON		Au OZ/TON					
3311	18-16-25 14J						X		X								
							1105		530								
3312	15						X		X								
							4400		9535								
3313	16						X		X								
							2.2%		2825								

1 Troy Oz/Ton = 34.28 PPM: ES = Em. Spectrograph X = X-Ray A = Atomic Absorption C = Colorometric O = Other

VS = Very Strong S = Strong M = Medium F = Faint ND = Not Detected

6-26-74

GEOCHEMICAL ANALYSIS

Date Received 6-18-74 Location Copper World Mine 176, Ariz.

Em. Spec. ..... X-Ray 6-25-74 Chem. ..... Geologist HSJ

Pulp No.	SAMPLE NUMBER T. R. S. IDENT.	Mo P.P.M.	Pb P.P.M.	Zn P.P.M.	Cu P.P.M.	Ag OZ/TON	Au OZ/TON		
3303	18-16-25 1BJ			X	X				
				60	50				
3304	3C			X	X				
				350	540				
3305	4			X	X				
				8579	2.6%				
3306	5B			X	X				
				590	590				
3307	7			X	X				
				190	145				
3308	8			X	X				
				115	1.6%				
3309	10			X	X				
				1075	7540				
3310	13			X	X				
				1.1%	3.7%				

1 Troy Oz/Ton = 34.28 PPM: ES = Em. Spectrograph X = X-Ray A = Atomic Absorption C = Colorometric O = Other

VS = Very Strong S = Strong M = Medium F = Faint ND = Not Detected

PETROGRAPHIC ANALYSIS

Date 6/19/74 Sample Location 13-16-25-AJ. Q 176., AZ

Submitted by: Jacobson Petrographer Luethe

Probable Original Mode	Present Mode	Notes
%	4% tremolite	replaces clinozoisite and diopside
%	2% phlogopite	
% hematite staining	3% clinozoisite	(partly → tremolite)
%	90% diopside	
tr. % zircon	½% chrysocolla	fracture fillings and stainings
tr. % malachite	½% opaques	(carbon?)
tr. % cambyite	%	

Rock Name diopside hornfels Original Rock

Alteration: upper mesozonal thermal metamorphism

PETROGRAPHIC ANALYSIS

Date 6/19/74 Sample Location 13-16-25-3DJ Qd. 176 Az

Submitted by: Jacobson Petrographer Luetke

Probable Original Mode	Present Mode	Notes
%	50% quartz	
%	30% microcline	
%	5% biotite	
%	4% muscovite	
%	3% plagioclase	
%	%	
tr.% zircon	%	

Rock Name Mica schist Original Rock

Alteration: Synkinematic thermal metamorphism (mesozonal)

PETROGRAPHIC ANALYSIS

Date 6/19/74 Sample Location Qd 176 13-16-25-11J

Submitted by: Jacobson Petrographer Luetke

Probable Original Mode	Present Mode	Notes
%	40 % quartz	
%	7 % plagioclase	
%	3 % biotite	(partly → chlorite)
%	2 % muscovite	(partly → sillimanite)
tr. % monazite	48 % microcline	
tr. % calcite	½ % sillimanite	
tr. % zircon	tr. % chalcopyrite (→ hematite)	

Rock Name granitic gneiss Original Rock

Alteration: katazonal metamorphism (syn kinematic)

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

ARIZONA BUREAU OF MINES

July 20, 1967

MEMORANDUM

To: Dean Forrester

From: Fred L. Stubbs

Subject: Inspection of Bobcat Mining Property--by Keith and Stubbs--on July 11, 1967.

Mill

Standard Copper has completed the expansion of the mill to an estimated 150 ton-per-day capacity.

This expansion involved the addition of a small rod mill (about 4½' x 6'), eight additional copper flotation cells and four additional zinc flotation cells. These cells were custom made to Mr. Sirgo's design.

Mr. Stuart R. Kaplan was present during our inspection and he said the cost of the expansion was about $28,000, plus labor.

The mill was shut down for repairs to the rod mill when we arrived in the morning, but was operating again by midafternoon. No operating data are available yet on the enlarged mill; however, the condition of the froth looked normal when we left the property in the late afternoon.

The rod mill seemed to be excessively noisy, as if the pulp density were low--this condition probably changed as the mill settled down from the start-up.

Seasonal electrical storms have caused numerous power failures that have reduced mill production.

Water is currently in ample supply and a fairly substantial tailing dam has been constructed across the draw below the camp. It is anticipated that some water will be recovered from the dam area.

A reported 1300 tons of broken ore has been stockpiled on the dump during the mill expansion.

Respectfully submitted,

Fred L. Stubbs

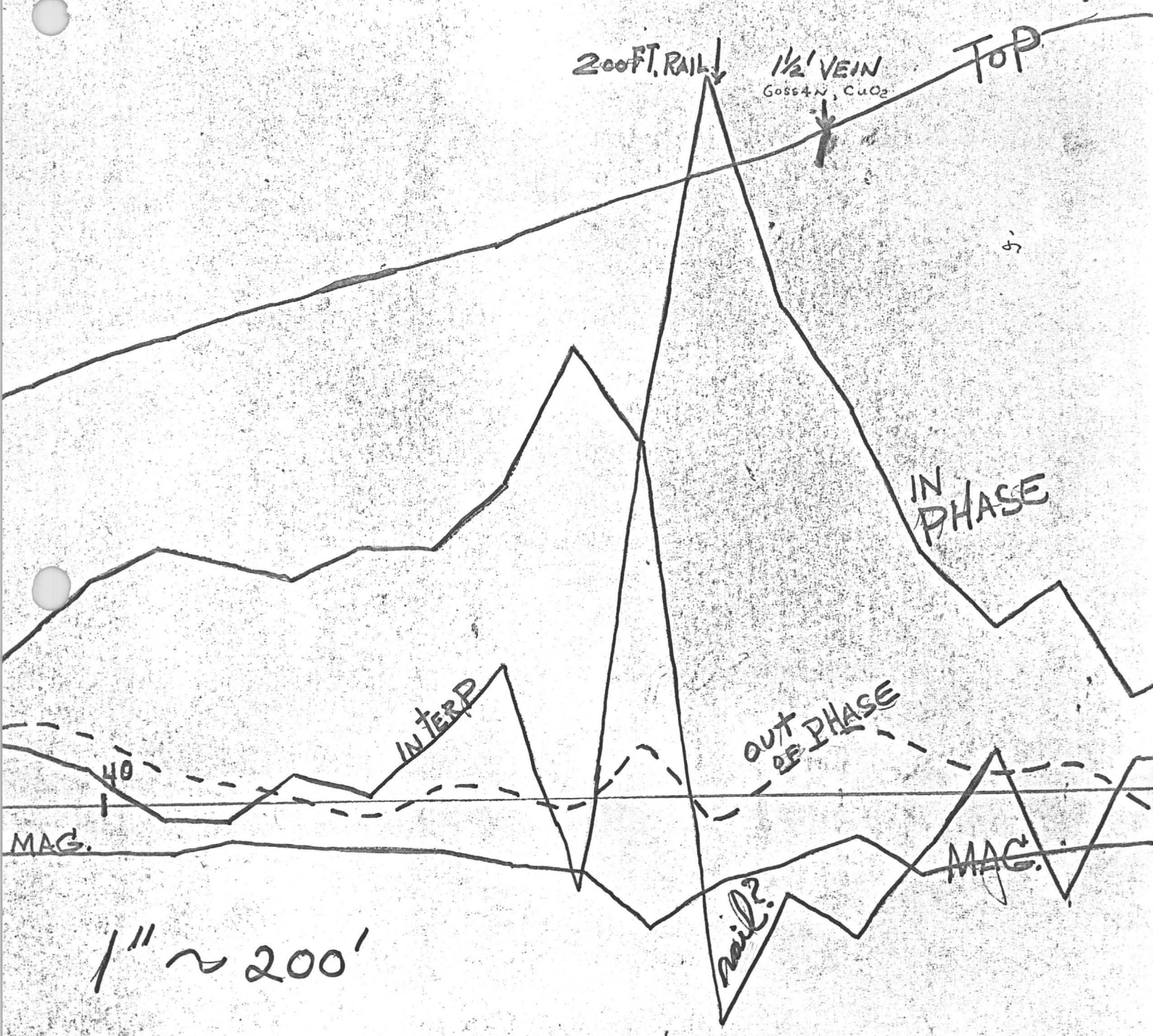
Fred L. Stubbs
Associate Mining Engineer

FLS:csf

Look N40 E

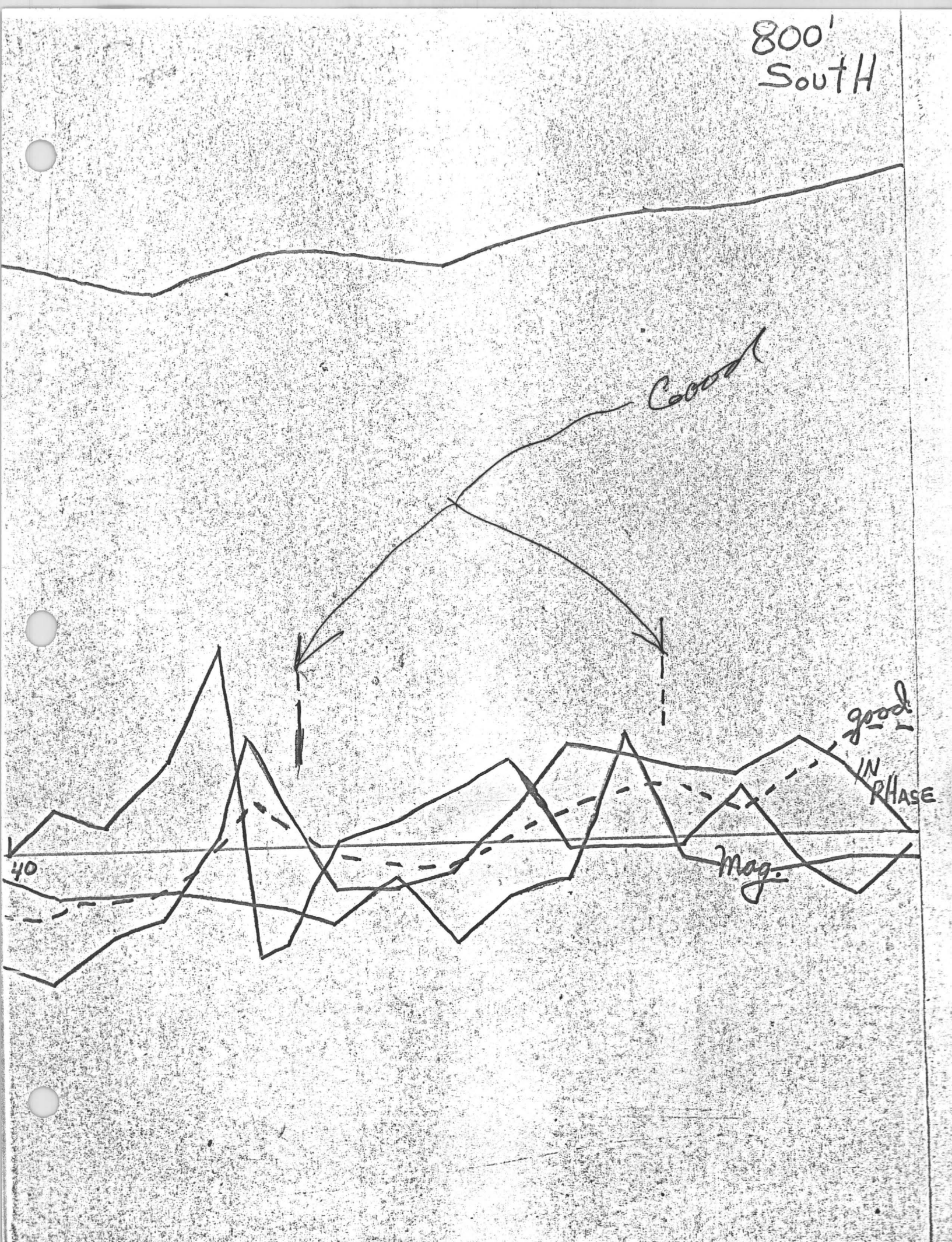
0

COPPER WORLD AREA

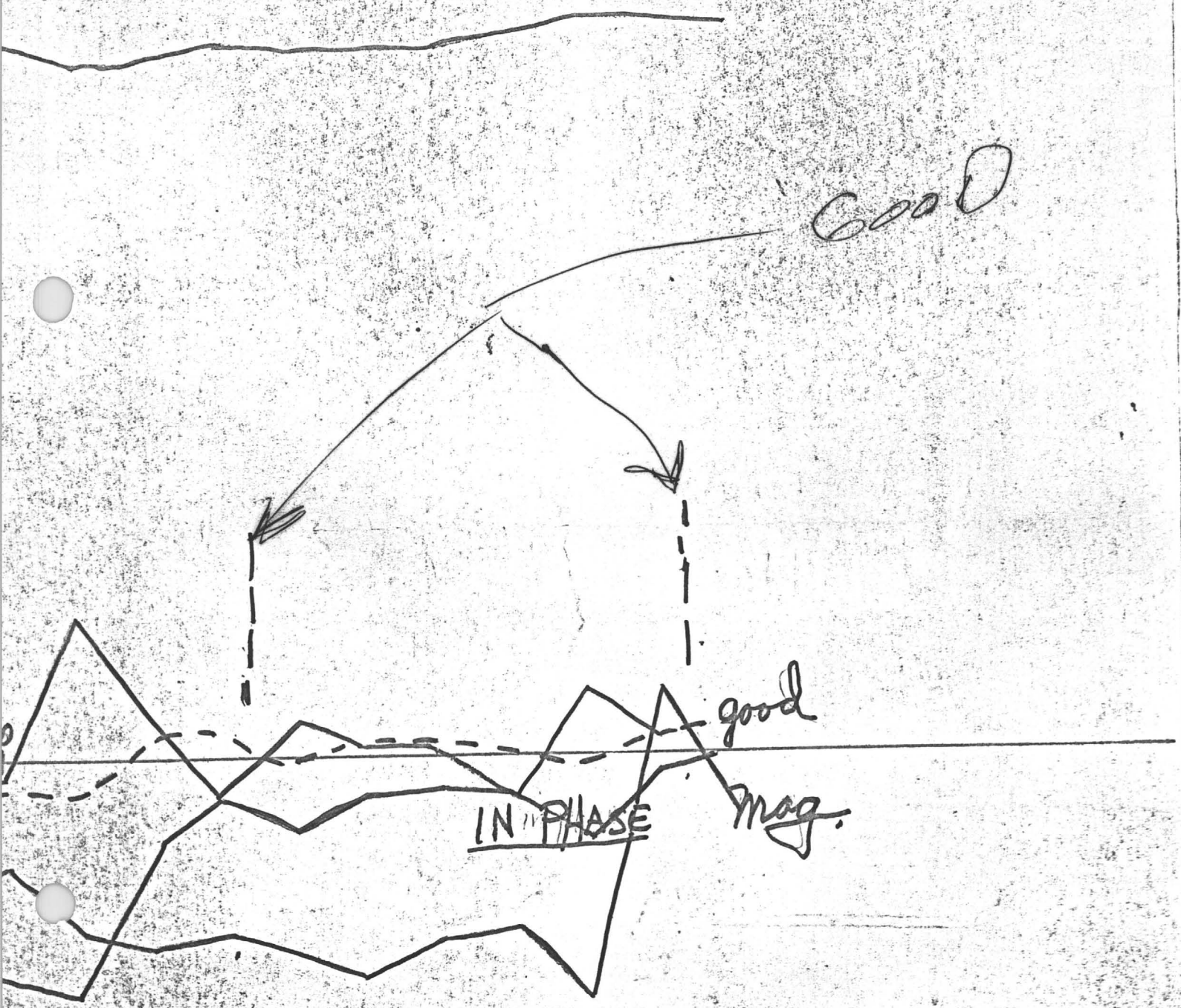


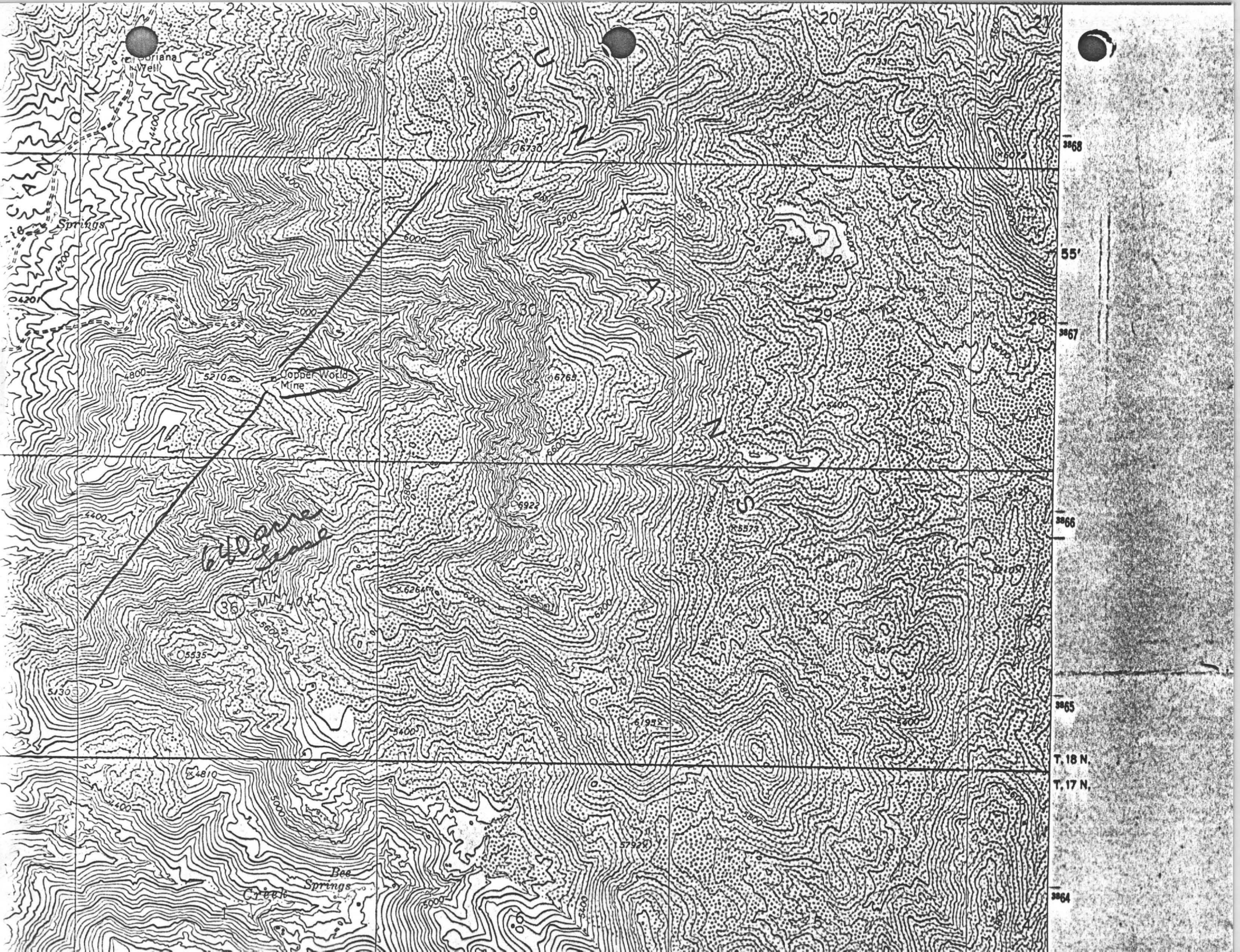
EM-16

1 FT. VEW


800'
South
Good
good
IN PHASE
40
Mag.

1600' South




Soriana Well
Springs
Copper World Mine
Bee Springs
Creek
STATE
MIN
T. 18 N.
T. 17 N.
55'