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TOMBSTONE M.D.
ARIZONA ~ CHARLESTON LEAD MINE ~ DATA BASE FROM SETH HORNE
& THE JAMES STEWART CO.

0267

CHARLESTON MINE

Charleston, Arizona

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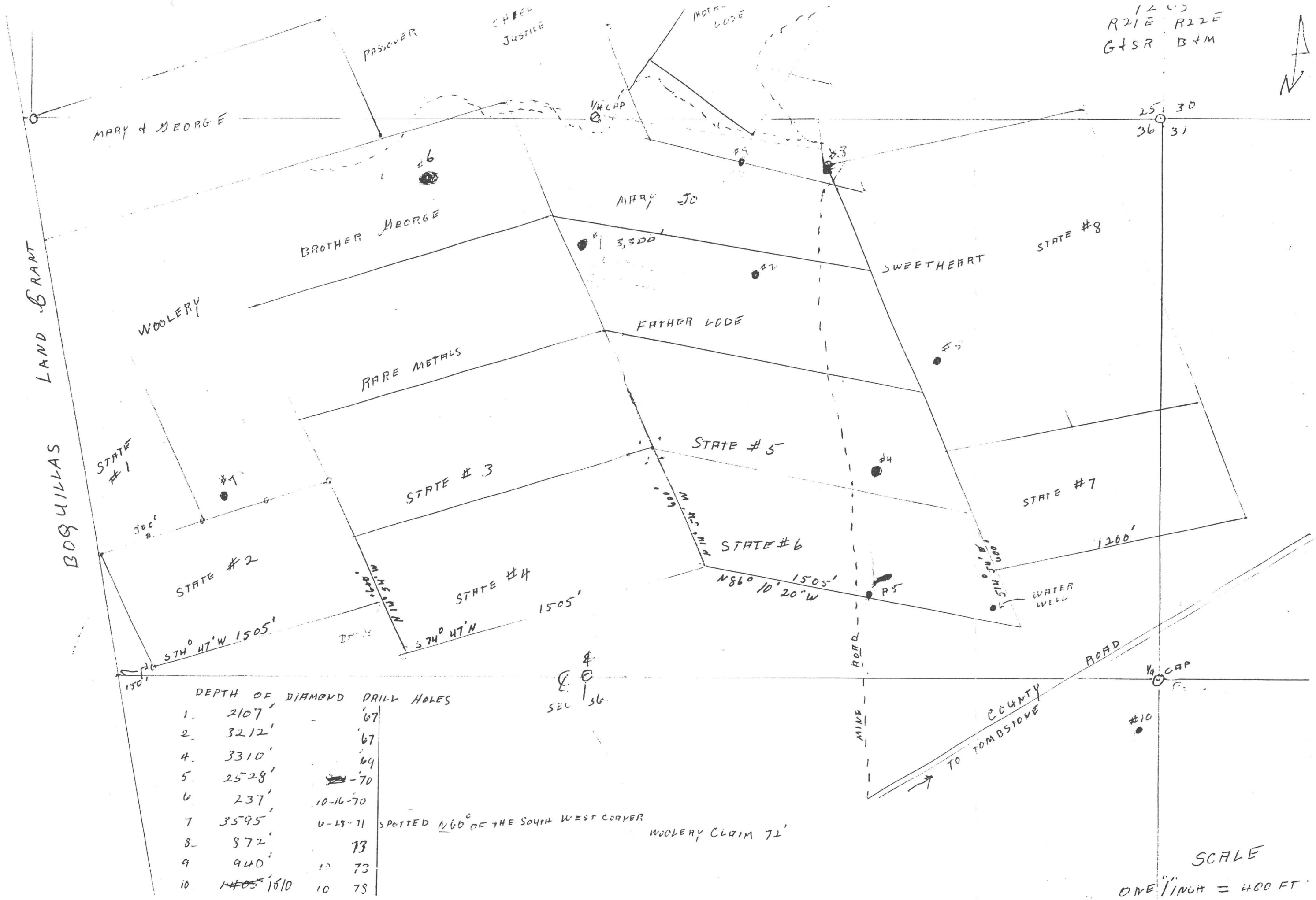


DEPTH OF DIAMOND DRILL HOLES

1.	2107'		'67
2.	3212'		'67
4.	3310'		'69
5.	2528'		-70
6	237'	10-16-70	
7	3595'	6-28-71	SPOTTED N66° OF THE SOUTH WEST CORNER WOOLERY CLAIM 72'
8.	872'		73
9	940'	10	73
10.	~~1405'~~ 1510	10	73

Hewitt Enterprises 12415 South 960 East Draper, Utah 84020 801 571-1911 Off. 801 571-0157 Res.

THE CHARLESTON MINE PROJECT
DATA COMPELATION
REPORT

August 10, 1970

The Charleston Mine area lies approximately six miles south west of Tombstone, Arizona. The property is reached by the Charleston highway.

In the Charleston Mine area a large zone of mineralization has been discovered. The zone appears to be at least two miles long and 3/4 mile wide. The estimated size of this zone of mineralization is based primarily on deep induced polarization prospecting. Three preliminary drill holes have tested this zone in the immediate vicinity of the old Charleston Lead Mine. All three holes have encountered ore grade mineralization of copper, lead, zinc and silver. These three holes have, in part, covered only a small area within the mineralized zone. A fourth hole, drilled off the mineralized zone, encountered very little mineralization.

The exploration done, to this date on the mineralized zone, suggests an economic mineral deposit to be present. The nature of the ore indicates the operation would be underground, generally along bedding planes. This, ofcourse, is only conjecture needing much better information for a basis of evaluation.

Since a large zone of mineralization appears to exist, it is a good possibility that the Charleston deposits are related to a mineralized intrusive monzonite porphyry similar to those of Bisbee, Mission, San Manuel, and others near by.

In conjunction with the deep mineralization found, the old Charleston Lead Mine itself should not be overlooked. The mineralization in the old Charleston Lead Mine appears to be unrelated to the deeper material. However, this may be due to a time factor and a long series of mineralization periods. The old Charleston Lead Mine may, at depths, contain sufficient reserves of Pb, Zn, Ag, and sericite to be of economic importance.

Further drilling of the mineralized zone is suggested, both to test the ore in the wide spaced holes 1, 2, and 4, and the general area. The drilling is by far the most important next step in exploration.

CLAIMS AREA

For the most part, the zone of mineralization is covered by mineral mining claims and state mineral leases. These properties are controlled by Horne Enterprises, 3033 North Central Avenue, Phoenix, Arizona.

GEOPHYSICS

Three phases of geophysical exploration were conducted in the Charleston area. Preliminary airborne magnetics covered the general area of interest. This was followed by very broad selected geochemical sampling and then induced polarization plus a small amount of ground magnetics.

AIRBORNE MAGNETICS

The general area covered by the magnetic survey is underlain by outcrops of different rock groups, which have a significant susceptibility difference. At the Schieffelin monument and

in the area surrounding, the Schieffelin granodiorite is exposed. Rock samples of this material are fairly magnetic. At the lower end of the Boquillas Land grant, on both sides of the San Pedro River, granodiorite similar to that at the Schieffelin monument is observed. Although in the Boquillas area the rock may be closer to monzonite and is more magnetic. North of the Charleston Mine many outcrops of the Uncle Sam porphyry are observed. This porphyry seems to be andesitic and is surprisingly non-magnetic. Southeast of the Charleston Mine and vicinity, rock outcrops are principally undifferentiated gray and white tuffs with sills and dikes of magnetic andesites and other basic flows. The tuffs are non-magnetic.

From the airborne magnetics the entire Tombstone district appears to be underlain by Schieffelin granodiorite. In most cases this intrusive lies at depths less than 1,000 feet. The intrusive lies as far westward as Section 39, Twp 20 S, R 22 E. A similar intrusive underlies the San Pedro River valley west of the surveyed area. Regional magnetics suggest the San Pedro River intrusive to be far larger in size than the Schieffelin granodiorite.

Between these intrusives lies the Charleston basin. Magnetically the rocks in this basin all appear to be similar. However, the surface geology suggests otherwise. With the abundance of magnetic andesite dikes and sills in the tuffaceous flows it would seem, if the vertical extent of this section were great, there would be some aggregate magnetic effect. Since this is not the case, two choices are possible: the tuffs are underlain at reasonably shallow depths by non-magnetic Uncle Sam porphyry or sediments. Our original interpretation was that sedimentary rocks

underlie the tuffs. This is borne out in drill holes 1, 2 & 4.

The Uncle Sam porphyry is found to be surprisingly uniform magnetically, almost as if it were a sediment rather than an intrusive sill or extrusive flow. This porphyry seems to have very little relationship to other igneous rocks in the area.

SURFACE MAGNETICS

Some of the igneous dikes, especially the andesite porphyries in drill holes 2 and 4, are altered and mineralized. Also they are fairly magnetic. Some surface profiles in the vicinity of the Charleston Mine indicate the possibility of an intrusive dike striking northeastward and paralleling the interpreted major mineralization zone along its north side. The significance of a porphyry mass in this area is not yet known. Additional information from further drilling will undoubtedly shed some light here.

SURFACE GEOLOGY

In the Charleston basin six geologic units may be observed.

1. Schieffelin granodiorite
2. Uncle Sam porphyry
3. Purple volcanics
4. White volcanic tuffs
5. Green to gray volcanics
6. Recent gravels and soils

1. The Schieffelin granodiorite mass underlying the Tombstone district and the San Pedro River valley is thought by this writer to be older than any of the other units observed, except for the cretaceous Bisbee formation. In the San Pedro River valley

the contacts with the volcanic series show the granodiorite to be much weathered before the deposition of the volcanics. It is believed this unit to be older than the volcanics or the Uncle Sam porphyry.

2. The Uncle Sam porphyry is reported to be of Miocene age and, as stated before, the true nature and age of this unit is not known. It is reported that this unit intrudes the white tuffaceous wolcanics but this age relationship is doubted. The porphyry covers a large area to the north of Charleston.

3. The purple volcanics vary from purple tuffs to brown argillites and includes agglomerates with some porphyry fragments. In places these rocks appear to have intruded the white tuffs.

4. White volcanic tuffs cover a large portion of the mine area and southwestward. The rock appears to be bleached and altered along shear zones which strike N 45° E. The rock is very hard and a great amount of silica has been introduced.

5. The green to gray volcanics appear much the same as the purple volcanics and are very similar in mineral composition. They are probably the same unit with insufficient iron for a reddish or purple appearance.

SURFACE MINERALOGY

Numerous shears are noted in a zone one and a half miles wide and striking N 45° E, through the Charleston basin. These shears vary from bleached zones with kaolin and sericite to quartz manganese veins. Parallel to the Charleston highway is a shear zone nearly five miles long and 300 feet wide. This zone has much bleaching by hydrothermal solutions and numerous veinlets of

limonite after pyrite. In most places this zone carries very minor traces of copper, with the exception of the southwest end. On the southwest end of this zone quartz veins with minor copper silicates are present.

Near the central part of the suggested Charleston mineralized area, numerous quartz manganese veins are observed. These veins contain larger amounts of copper than the shear zones.

On the north edge of the outlined mineralized zone the Charleston Mine occupies a shear zone in the volcanics. The shear is noted by considerable sericite alteration containing galena, sphalerite and pyrite. This zone appears to be the only one in any way related to the deep mineralization, and that is questionable.

The only relationship of the surface mineralization to the deeper sulphides is that secondary hydrothermal solution from recent or post mineral faulting may have carried minor amounts of mineral through the overlying volcanics. This in part is the reason for giving emphasis to the deeper sulphide zone.

SURFACE GEOCHEMISTRY

In the Charleston basin numerous veins, shears, and altered zones are noted. The great majority of these zones strike N 45° E. As mentioned earlier, three types of mineralized shears are noted. It was felt that these zones, even though they appear to be post mineral, may contain secondary deposition of minerals, especially the quartz manganese veins. Rock sample tests of the three groups indicate anomalous amounts of copper, zinc, and silver in the quartz manganese veins. The mineralized shears with kaolin, limonite, and

bleaching contained the smallest amounts of these elements, only slightly above the fresher volcanic tuffs. These samples though inconclusive do aid in encouraging the possibility of ore mineralization in the underlying subsurface, outlined by the induced polarization.

INDUCED POLARIZATION

Initial tests made on the Charleston basin, using a Wenner configuration with a 1,000 foot electrode spread, indicated nothing of a polarizing nature at depths less than 1,000 feet. Later tests, using this same configuration, suggest that a shallow zone of mineralization exists in the eastern part of the area, Section 30, Twp 20 S, R 22 E. The depth to this zone is estimated to be approximately 185 feet.

With a modified 2 array (note fig. 1) electrode configuration, depth spacings of 3200 feet were attainable. This consisted of placing one current electrode at electrical infinity and the other at the depth station. A reference potential electrode was placed in the direction of the moving potential electrode at 6400 feet from the current energizing electrode. Resistivity and IP readings were made, out from the current electrode, between the reference pot and the moving potential electrode.

Expanders were made in four quadrants, in most cases, depending on accessibility. By doing a sufficient number of these expanders, data was deemed dense enough to contour. Data values were plotted half way between the current electrode and the moving potential electrode for any given depth separation. For example, the IP value would be 10 milliseconds at 1600 feet from the

current center. This value was thus plotted at 800 feet in the direction of the reference pot. The data points were then contoured. Note that contours for 2000 and 3000 feet separations are enclosed. The 2000 and 3000 foot contour maps are from data using the modified 2 array configuration. The 1000 foot electrode separation contour map is based on data from Wenner array traverses as mentioned before. Several typical depth curves are enclosed.

Measurements were made using D.C. power-pulses of 4 seconds at 5 to 6 kw. A .35 second delay was used before an IP integration of 0.8 seconds took place. The D.C. pulse system is repetitious for several cycles to give a good repeatable impressed EMF and IP value. The Hewitt Enterprises system is comparable with the Newmont or Huntex methods.

The induced polarization results indicate that a buried polarizer lies beneath the volcanic cover in the Charleston area. The zone appears to be elongated in a northeast southwest direction, striking approximately N 45° E. It appears that this polarization represents sulphide mineralization, having a width of 3000 feet minimum and at least 2 miles in strike length. An average depth to sulphides is estimated at 1000 feet below the surface. From the results of DD#4 it appears that an average total sulphide percentage for the whole mineralized zone may be approximately 3%.

GEOLOGIC SECTION

The enclosed geologic section is based on drill holes 1, 2, 3, and 4. The principle rocks of the section are post mineral Bronco volcanics, the Bisbee formation sediments and the Uncle Sam porphyry. The contact between the post mineral volcanics and the

underlying sediments is noticeably a basal conglomerate. The Bisbee formation in this area consists of bands of quartzites, arkose, redbeds, argillites and silicified limestones. It is most difficult, if not impossible, to find a marker bed which is identifiable across any two drill holes. The section interpretation is based primarily on the predominance of redbeds or quartzite.

MINERALIZATION

Ore mineralization encountered in the drilling consists of, in order of importance, sphalerite, chalcopyrite, galena, and silver. The mineralization is generally associated with the more arkosic sections of the Bisbee formation. However, in many places mineralization occurs in an andesitic porphyry which seems to be abundant as narrow dikes and sills within the Bisbee formation. The stronger ore sections show considerable sericite and quartz alteration.

Mineralization appears to be disseminated along bedding in most cases, although sections of massive sulphide may form veins.

From the polished sections data enclosed in this report, it appears that several phases of mineralization occurred in this deposit. Pyrite and quartz seem to be the predominant minerals in several of these stages. The polished sample studies suggest the galena and sphalerite are closely associated. The chalcopyrite and silver also appear to be closely related. Since several stages of mineralization seem to be present in the deposit, economic importance may be considerably enhanced.

CONCLUSIONS

Several sections of mineable ore have been encountered in the drilling to date. The reader is referred to the enclosed assay summaries and drill hole logs for an evaluation of the drilling results. Even though many sections of ore grade material were encountered, it is difficult to relate ore in one hole to the next, because of the wide spaced drilling. However, sufficient mineralization has been found to warrant both the use of definitive drilling on shorter hole spacings and general exploration drilling.

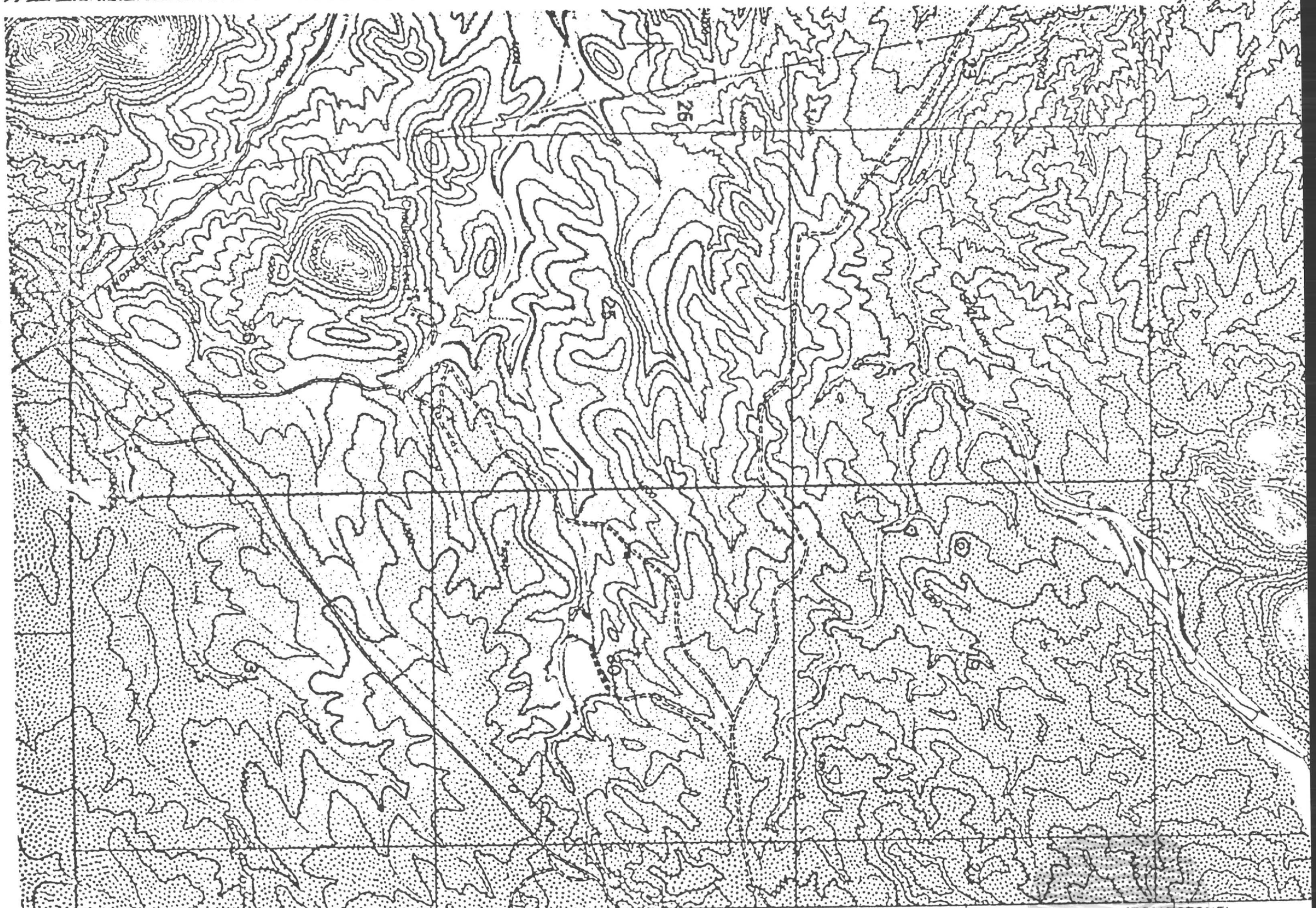
It is important that a very minimum number of holes, within the suggested large mineralized area, have found economic mineralization. It is quite possible that this mineralization lies within the vicinity of a significant porphyry copper deposit.

The geologic environment appears to be favorable to economic mineralization. This, in conjunction with the wide zone of interpreted sulphide mineralization, encourages continued exploration and development. Those familiar with recent mineral discoveries in the southwest will realize that each of them were the result of exploration in situations such as this. We appraise this property to be worthy of a vigorous exploration program.

HEWITT ENTERPRISES

Loyd A. Hewitt

Loyd A. Hewitt



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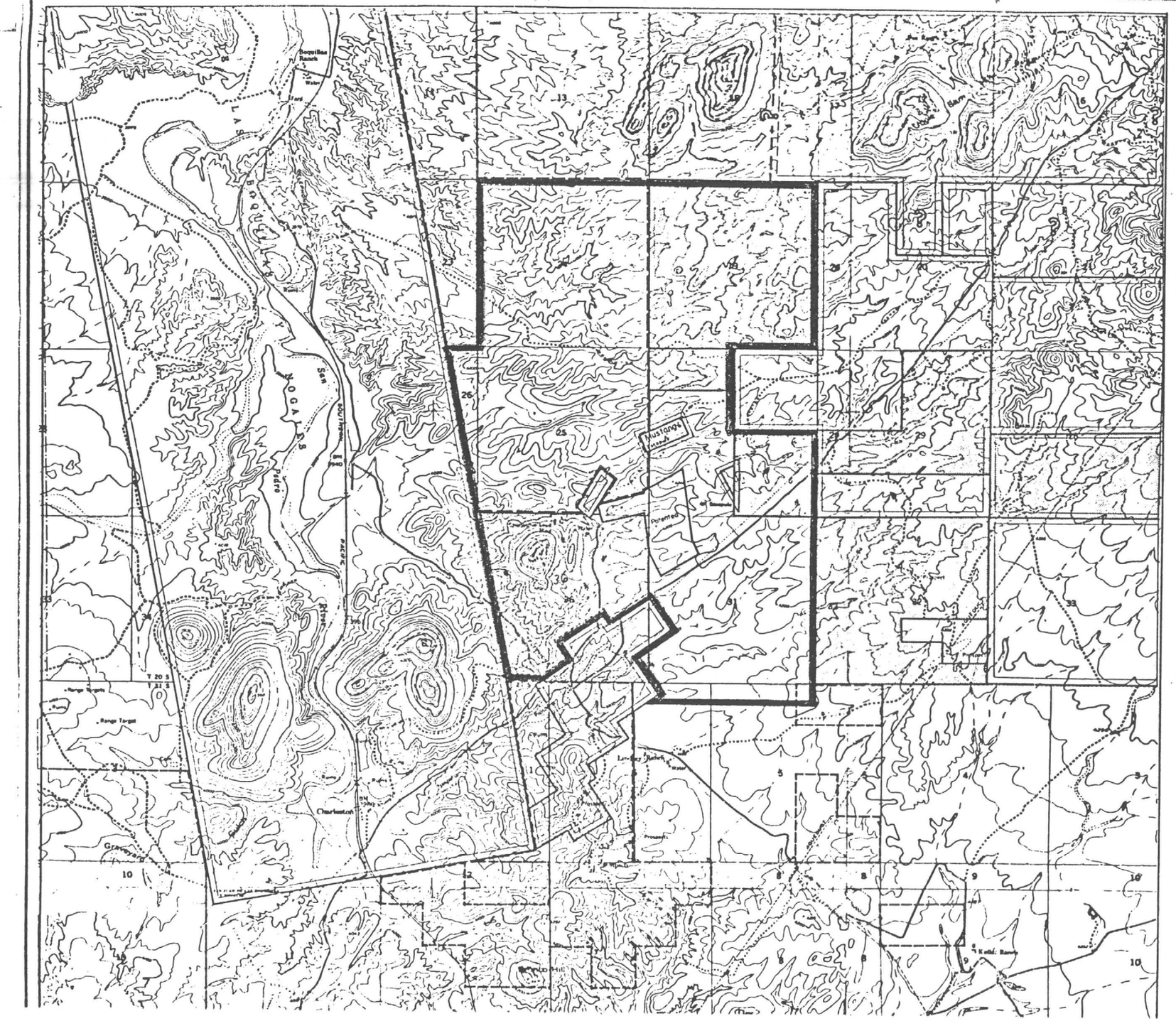


NORTH

EXPLANATION

- Tombstone Mineral Reserve (lode and patent)
- Sierra Mineral Management (lode and patent)
- Horne-Stewart Company (lode and patent)
- Gallager Vanadium & Rare Minerals Corp. (lode and patent)
- Tenneco Land Grant
- State Mineral
- Withdrawal - Charleston dam & Military purposes

PROPERTY MAP OF THE CHARLESTON MINING DISTRICT

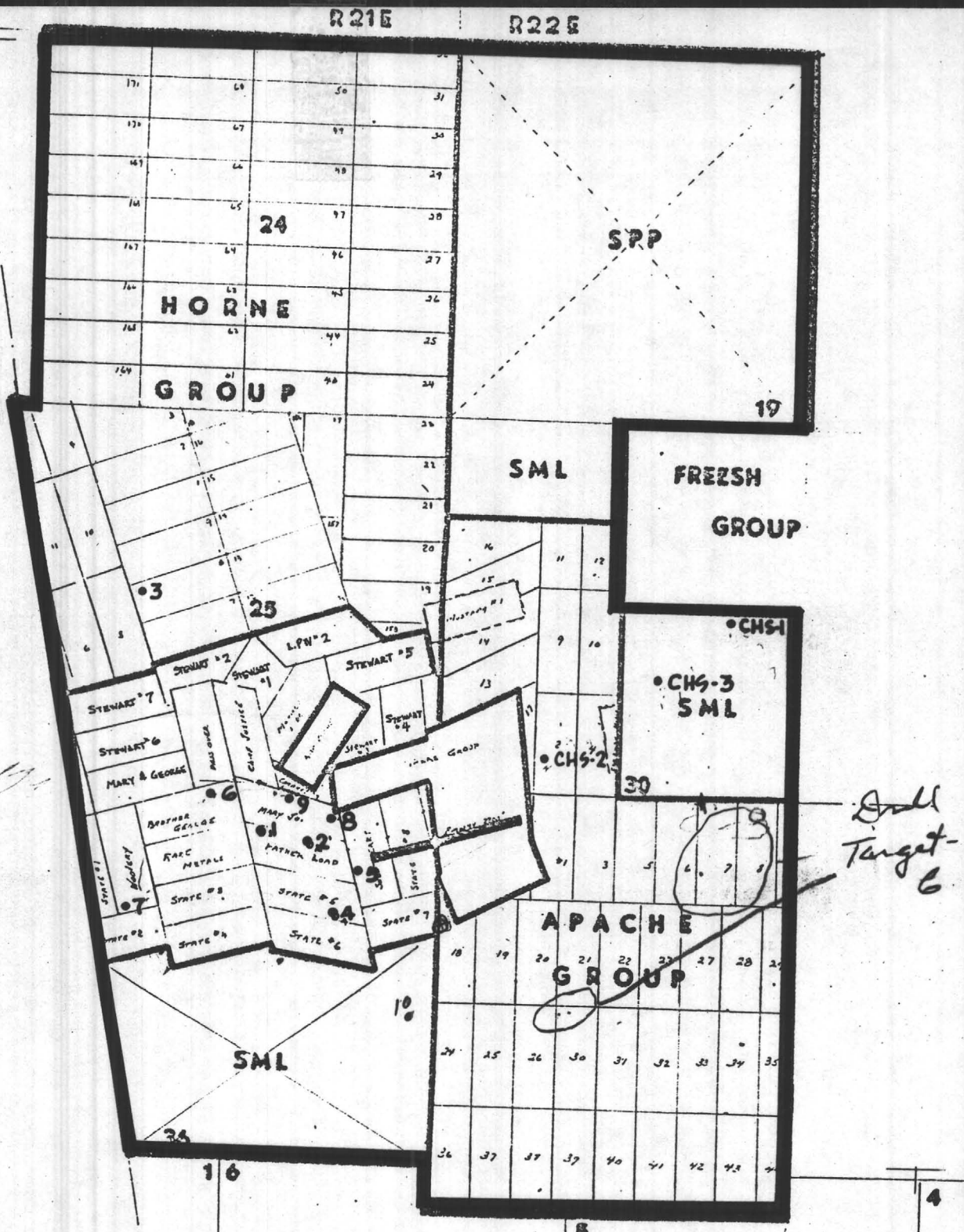
T. 20-21 S., R. 21-22 E.
COCHISE CO., ARIZONA

SCALE 1:48,000

JRK

SEPT. 1973

3



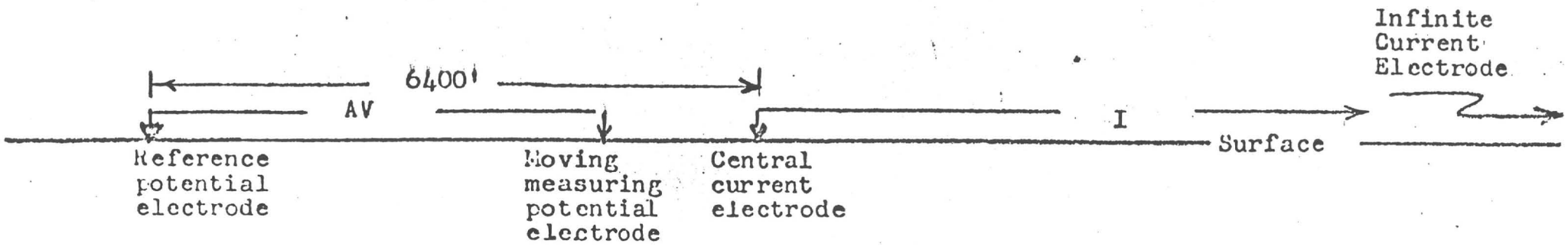
DEPTH OF DIAMOND DRILL HOLES

• 1	2107'	• CHS-1	4002'
• 2	3212'	• CHS-2	5020'
• 3	2617'	• CHS-3	3005'
• 4	3310'		
• 5	2528'		
• 6	237'		
• 7	3595'		
• 8	872'		
• 9	940'		

DRILL SITE OVER-LAY

CHARLESTON MINE

18 AUG 75



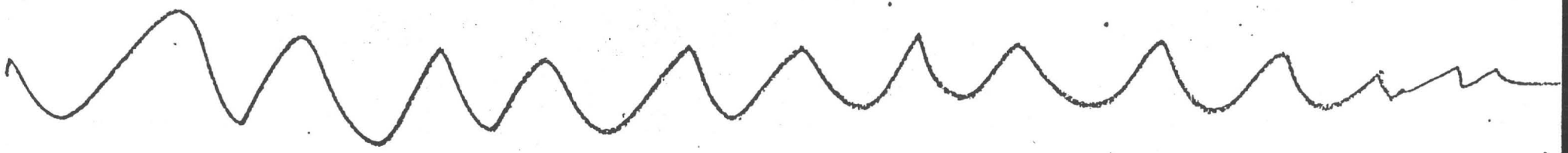


Fig. 1

Modified 2 array electrode configuration

T20S
2700
2775
2475
2625
2400
2325
2250
2175
2100
2025
3000
3075
3150
3225
3300
3375
3450
3525
3600
3675
3750
3825
3900
3975
4050
4125
4200
4275
4350
4425
4500
4575
4650
4725
4800
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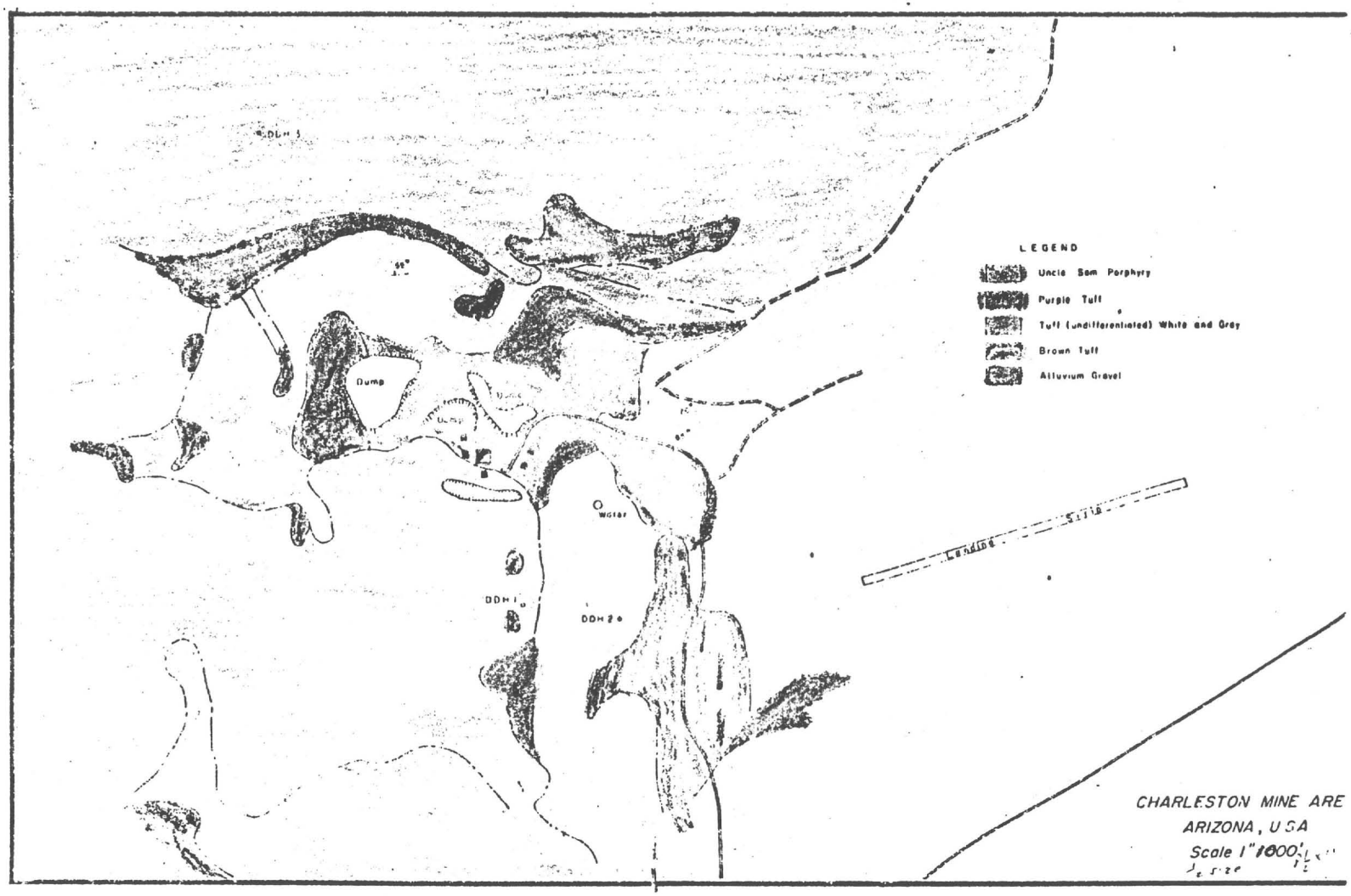
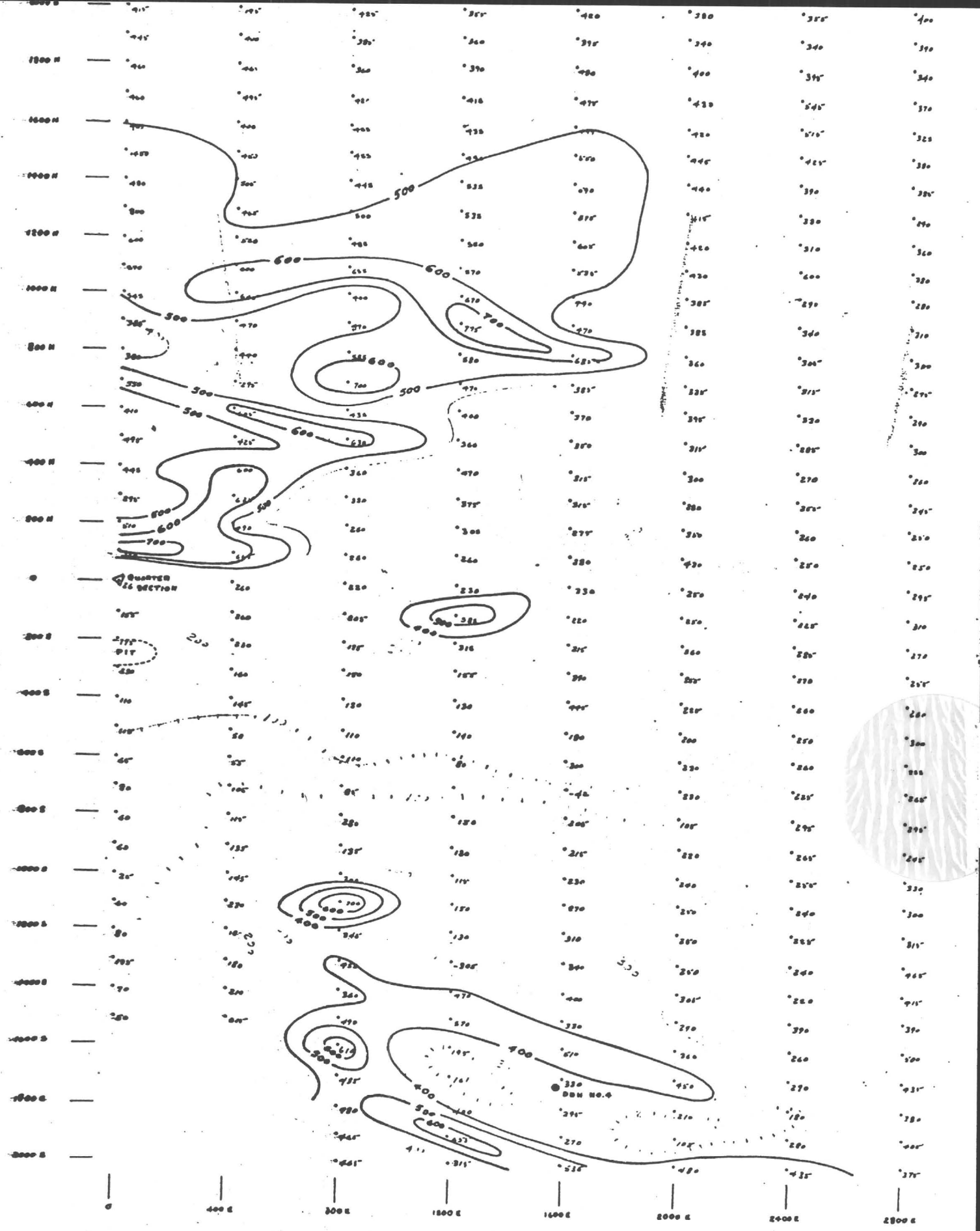
5775
5850
5925


DDH 3
Dump
Water
DDH 1
DDH 2
Landing Strip
LEGEND
Uncle Sam Porphyry
Purple Tuff
Tuff (undifferentiated) White and Gray
Brown Tuff
Alluvium Gravel
CHARLESTON MINE ARE
ARIZONA, USA
Scale 1" 1000'



TOMBSTONE CHARLESTON

VERTICAL INTENSITY

MAGNETICS

16 MAY 70

7

Drill Hole No. 2
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Page 1
By

Scale
Started
Completed

Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2271 Porphyry latite andesitic (Uncle Sam latite por) feldspar qtz fprph dk greenish buff to purple contacts bxt'd and altd composite zone qtz latite porph about 6' at 2222

2290 Qtzite-and tuff? siltstone dk gy qtzite-bxt'd zone w/locally heavy sphal as cs diss clots and high < 1/16" stringers

2300

2323 Qtzite-grades from fg silty to med g sandy 2/calcite cement

2350

2407 Siltstone-variable gy, purple buff, local sandy zones numerous fn calcite stringers last 10' strongly alt'd, bxt'd kaolinized ½" wide replacement stringers of cpy at 2399 cuts core at 15° to axis.

2400

2435 Qtzite siltstone interbedded bxt'd diss sphal 2423 over 8" in a dk gy bxt'd qtzite? some cpy diss

2450

2452 Tuff? dk gy to buff-incls n fg silty mud at bot of enty

2458 Qtzite - pinkish

2490 Siltstone-varigated pk and green bleached borders along epidote zones also runs of dk purple mudstone v fg-hemotitic packing (bedding) 45° to core

2500

Drill Hole No. 2
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

Page
By

Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2553-2572 Siltstone, purplish red, grades into tactite at 2555, f grained, gy, epidote splotches. This in turn grades into qtz at 2560, med gy qtz to 2572

2572-2574.5 Qtz, med gy, grades into banded f gy tactite at 2573. Tactite to 2574.5

2550 2574.5-2626.5 Tactite, metamorphosed calcareous arkose, qtz lenses, mudstones, siltstones, strong epidotized. Diss py at intervals in certain intervals, minor sphal and cpy loc in small veins.

2626.5-2657 Qtz, with chlorite and iron rich cement, epidote & calcite blebs at intervals, minor sphal and cpy 2247-2248.6

2600

2657-2669 Meta-arkose, qtz, epidote and calcite blebs, to 2669

2650 2669-2672 Mudstone, reddish, with epidote spots to 2672

2672-2694 Shale, siltstone to 3688, then qtz to 2694

2694-2704 Shale, dk purplish shale, grading downward to siltstone epidotized in part

2700

2704-2727 Qtz, lt gy in color, f grained grades to med grained

2727-2754 Shale & qtz. F gy shale, loc purple in color to 2731, then f qtz to 2739, then lt gy med f to med grained. Arkosic locally. 2752-2754

2750

Drill Hole No. 2
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

By

Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2754-2791 Tactite, qtzt. Lime-silicate (tactite), locally serpentinized, followed by qtzt to 2759. Two feet of shale, th gy mottled qtzt to 2770, thereafter increasing lime silicate (epidote), f grained, dense, hard to 2791

2791-2839 Qtzt, tactite. Fine to med grained qtzt to 2808, lime silicate to 2818, f grained qtzt to 2839

2800

2839-2845 Shale and lime-silicate.

2845-2882 Qtzt, f, gy, dk shale to 2850 grading through siltstone to f qtzt to 2868. Med qtzt for 2', then purple shale, locall epidotized, to 2882.

2850

2882-2902 Qtzt, f gy, grading into med grained epidotized qtz, to 2890. At 2890, 6" interval with cpy. (10% cpy) Below cpy zone, mottled f grained siltstone to 2893, then dk gy f siltstone, becomes lighter with depth and grades into epidotized lime-silicate at 2902

2900

2902-2915 Dark purplish shale, lime-silicate 2905-2908, then shale and qtzt

2915-2973.5 Qtzt, lt gy, f grained, banded with epidote, bedding 60° to axis of core, becoming med grained at 2926. 6" med grained qtzt with cpy at 2929; estimate 5% cpy. Barren shale and lime-silicate below to 2953, then 6" med qtz w/cpy, 7% cpy estimated. Underlain by barren shale and qtz, 30° angle to axis of core. Estimate 25% cpy in this interval, then 6" barren qtz, then 1" solid cpy vein at 30° to axis of core, then barren med grained qtz to 2973.5

2950

2973.5-2997 Qtzt, med to coarse, arkosic, 1/8" cpy vein at 2989, otherwise barren.

3000

Drill Hole No. 2
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

Page
By

Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2997-3045 Shale, ls-silicate, minor serpentine, epidote bunches 2' of dk shale 3043-3045

3045-3062 Lime-silicate, shale, (some serpentine), to 3049. 2' dense siltstone, 3049-3051, then lime-silicate. 1" cpy 3051.4. Chert 3054-3054.5, qtz 3057-3061. Fault zone 3061-3062

3050

3062-3072.5 Sericite, argillite, some gouge at 3062, spotted at 3065, py clots and dk angular patches, probably originally a calc-arenaceous rock, sp. 3065.5% py+. Grades downward into quartzitic-looking rock with dark patches, then to 24" dk gy-gr dense hornstone with reddish and greenish patches plus py, to contact with epidotized and pyritized andesite(?) porphyry. Spec. 3074

3100

3072.5-3128.5 Andesite(?) porphyry. Feldspars are epidotized, rock is pyritized. upper contact not cored. Lower contact at 25° to axis of core. Probably a dike.

3128.5-3154 Qtz, very f grained, or tactite, grades into granular ls-sil w/splotches, very f grained, lt to med ty to 3139.5 (at 3141, bedding at 80° to axis) then darker gy to 3142.5, epidotized zone to 3146, then massive very dk gy siltstone w/qtz. frags (less than 0.5 mm) to 3148. Py & epidote on seams at 3148. Med gy siltstone, minor py on seams. Grades to lt gy tactite with splotches at 3150, then to f lt gy qtz at 3154.

3150

3200

3154-3177 Qtz, massive to 3163, then banded, alternate f to med. Bands (bedding) at 75° to axis. Banded to 3167, then massive med grained, to 3175.5, then coarse grained, arkosic, w/py (2%) to 3177. Gradational contact with tactite.

Bot.

3177-3181.5 Tactite, med gy, v f grained, w/epidote splotches

3250

Drill Hole No. 2
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Cochise County Arizona

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

3181.5-3187 Arkosic qtz. Epidotized. Spots of cpy at 3185, 8" fairly good cpy 3186.5-3187+. Interval not yet split, will run about 10% cpy - 4%+ copper.

3187-3193 Tactite, epidote splotches, variable in color, dk gy t lt gy. Spot of cpy 3192.5 in bleached & epidotized spot, grades to very f gy qtz at 3193.

3300

3193-3207 Qtz, f grained, lt gr, impure, locally splotchy w/dk gy spots grades downward into sitlstone. Impure siltstone w/epidote clots after 3201, grading back into more quartziti material after 3207

3207-3212 Qartzite, light gray, impure, medium grained.

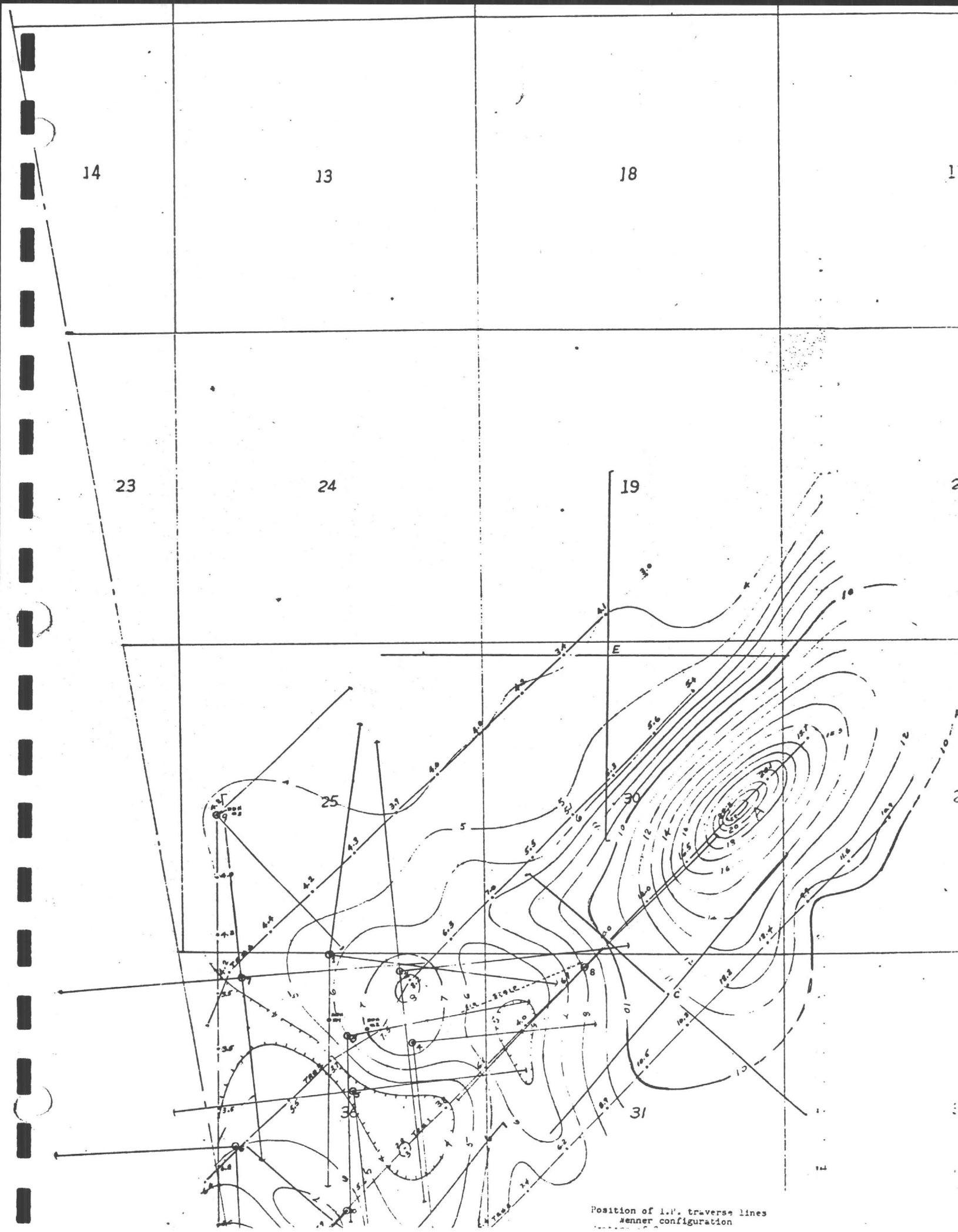
3350

Bottom - Complete

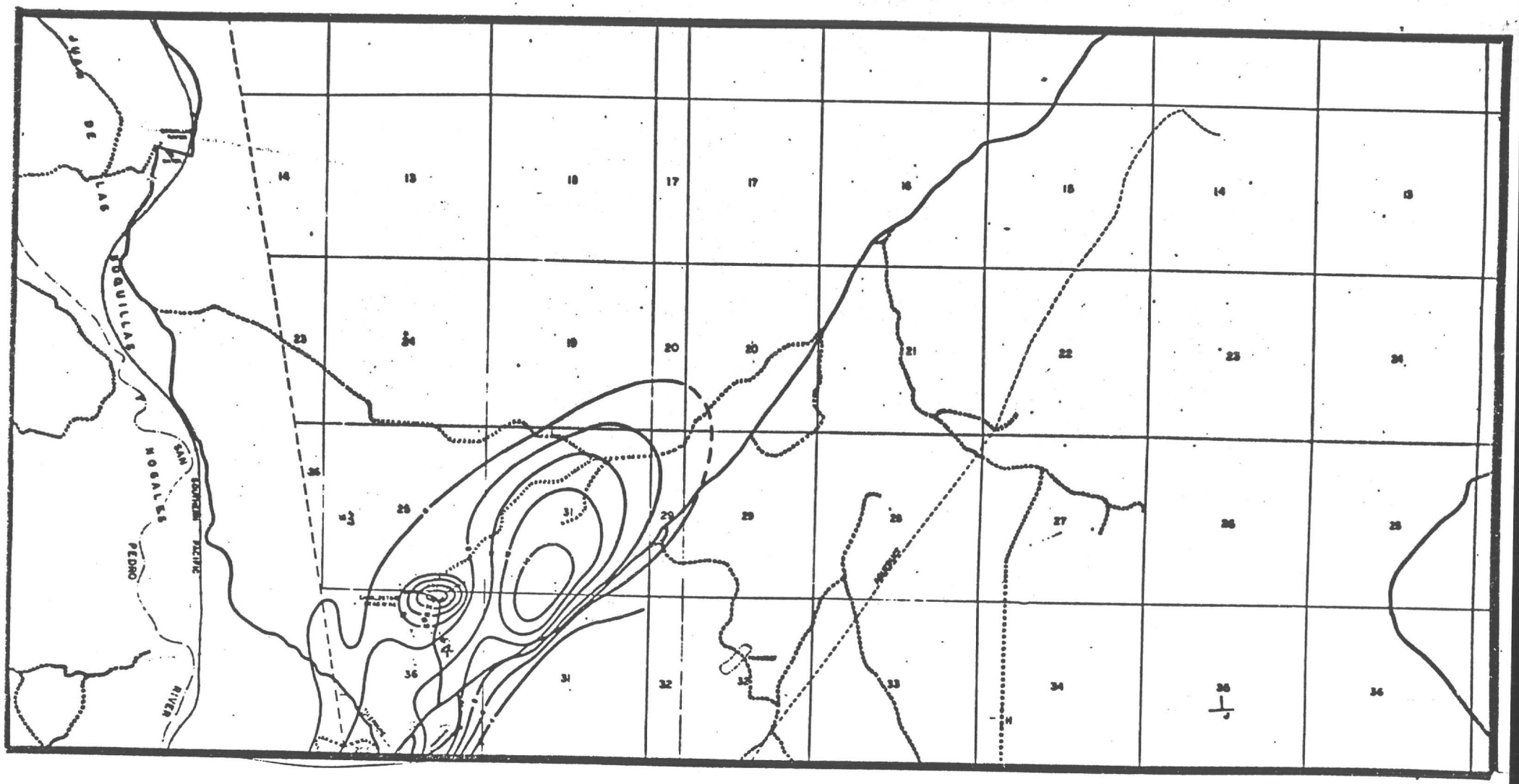
3400

3450

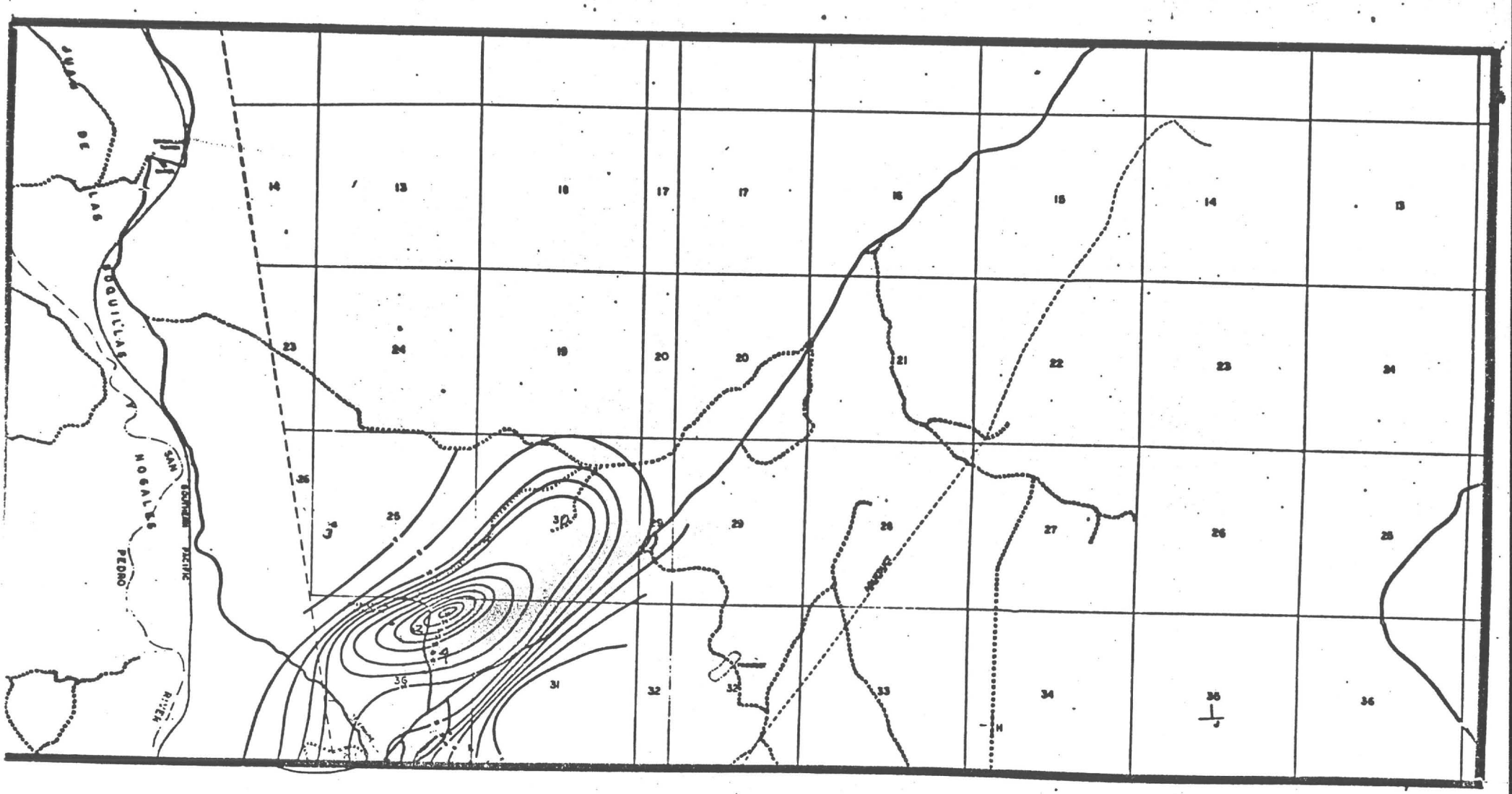
3500



Position of I.P. traverse lines
Wenner configuration



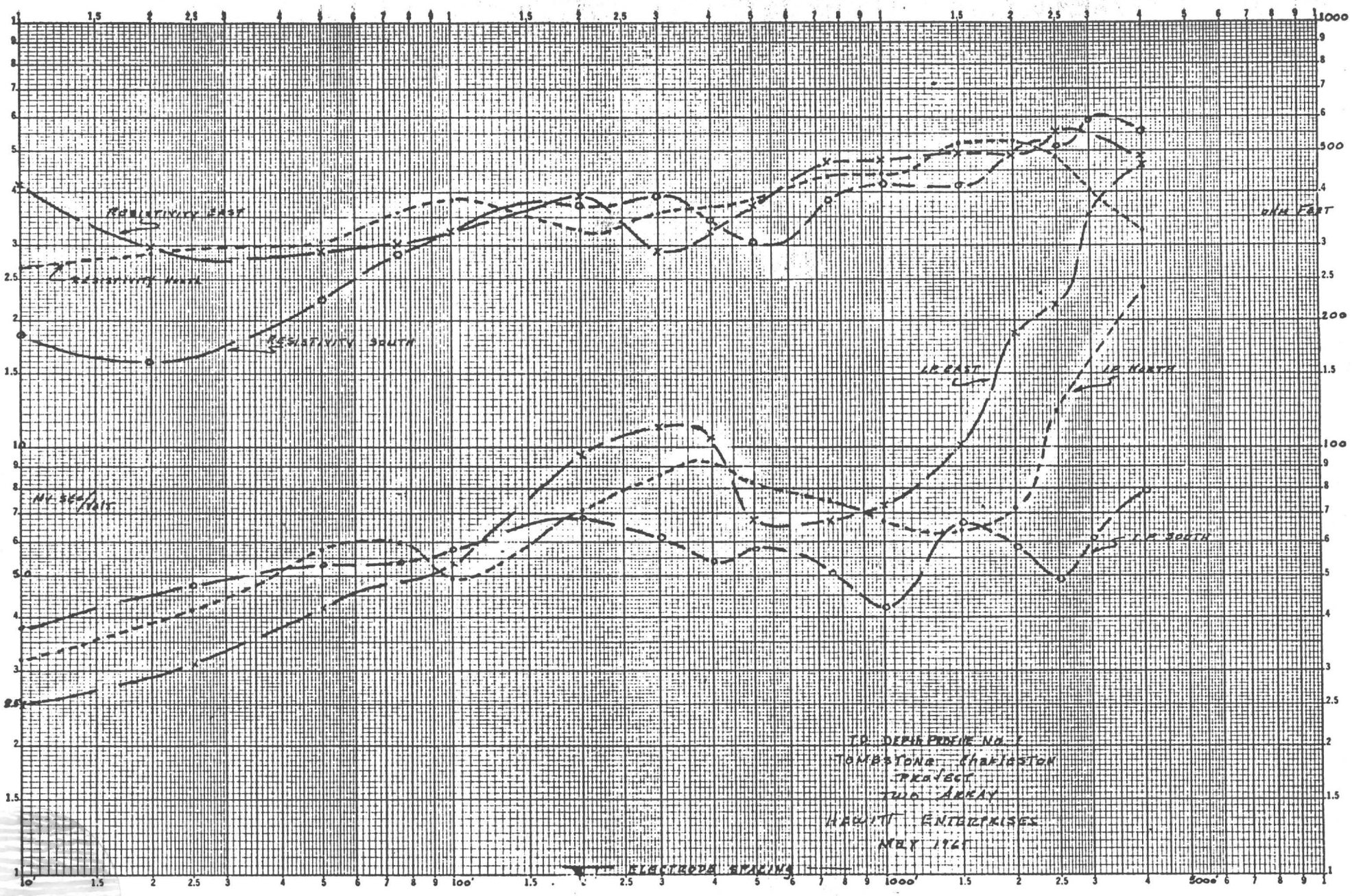
TOMBSTONE - CHARLESTON PROJECT
INDUCED POLARIZATION CONTOURS
SCALE 1" = 1000'



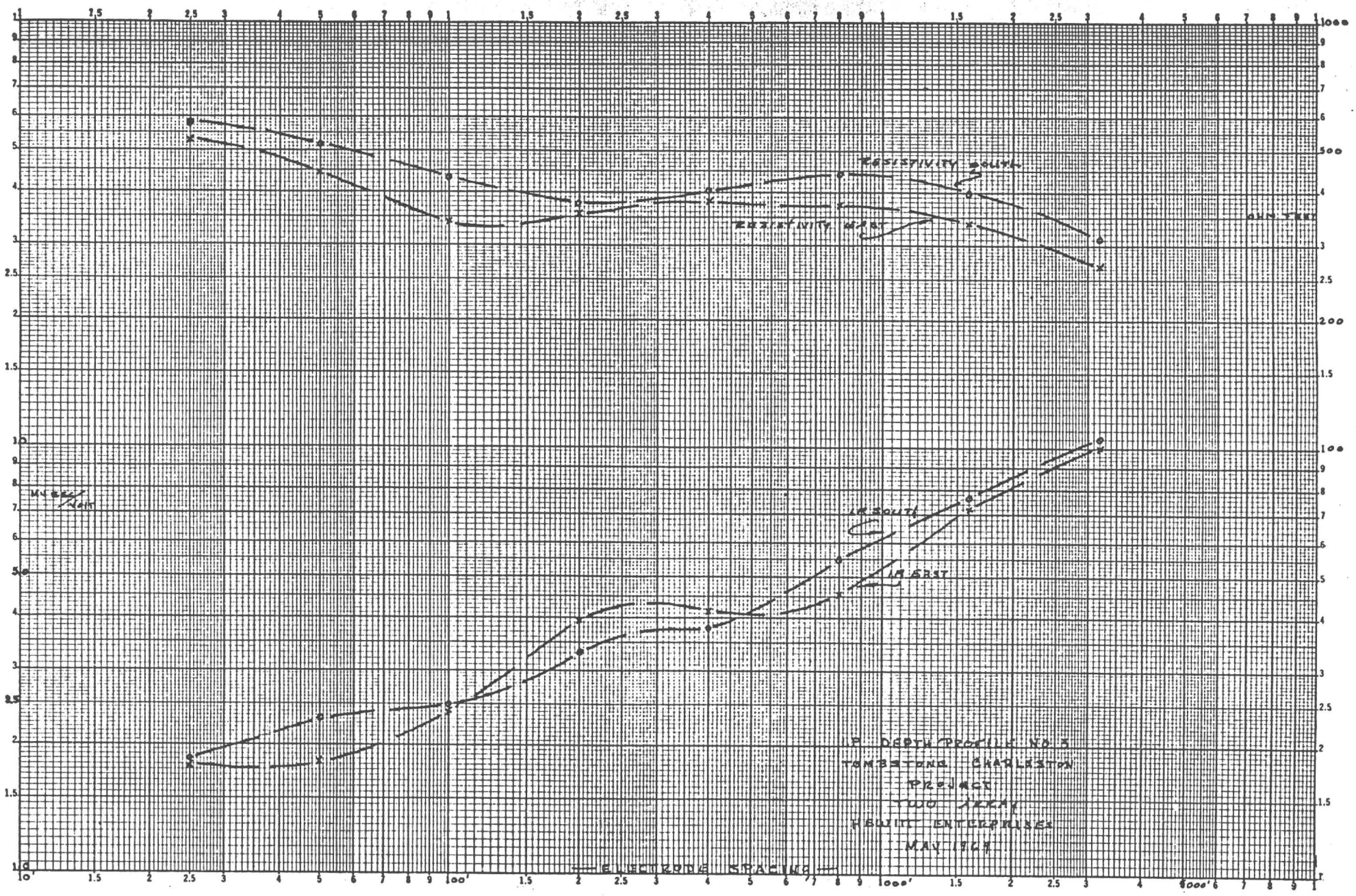
TOMBSTONE - CHARLESTON PROJECT
INDUCED POLARIZATION CONTOURS
"A" = 5200'
SCALE 1" = 1000'

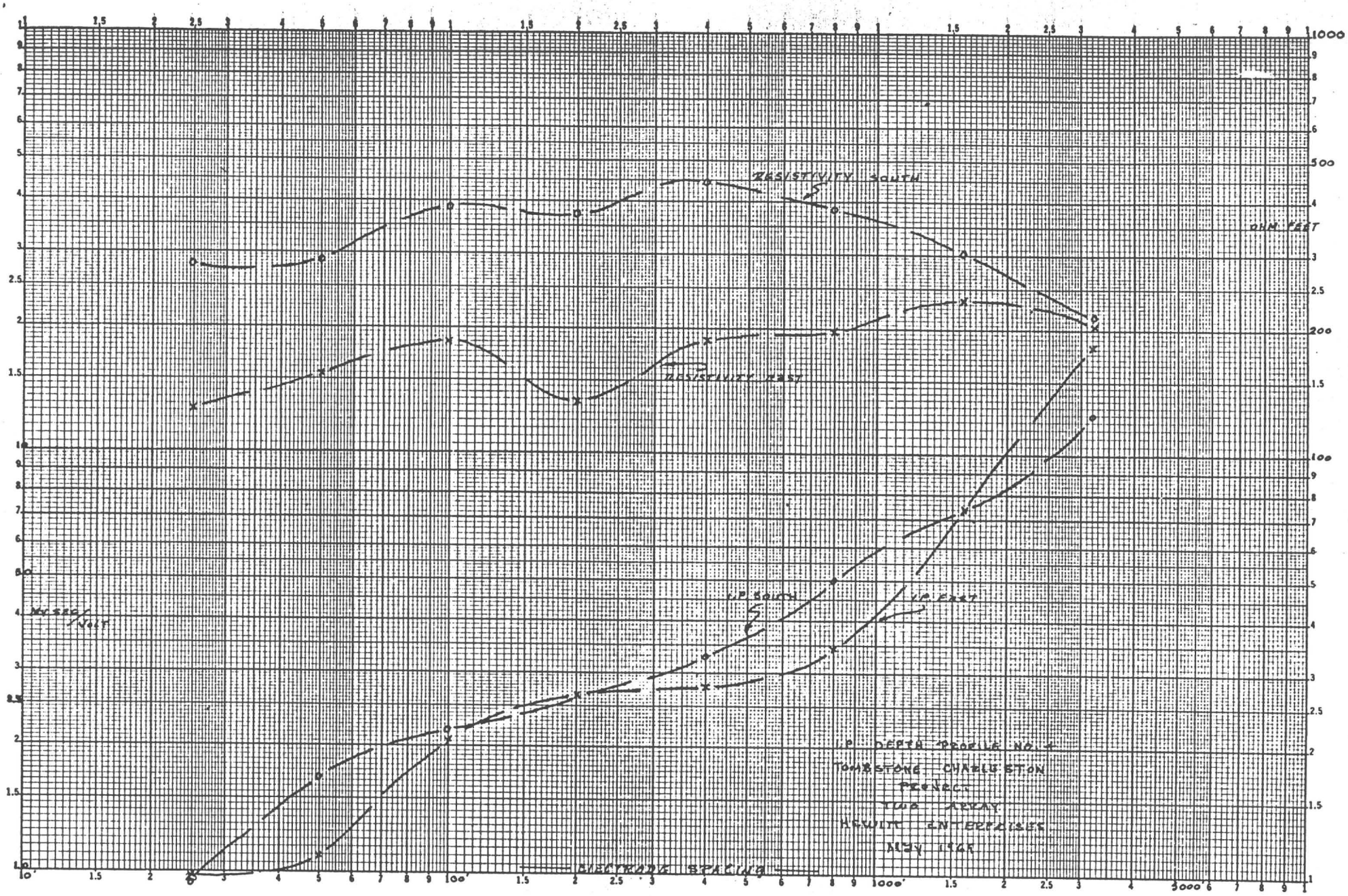
TRUE NORTH
MAGNETIC

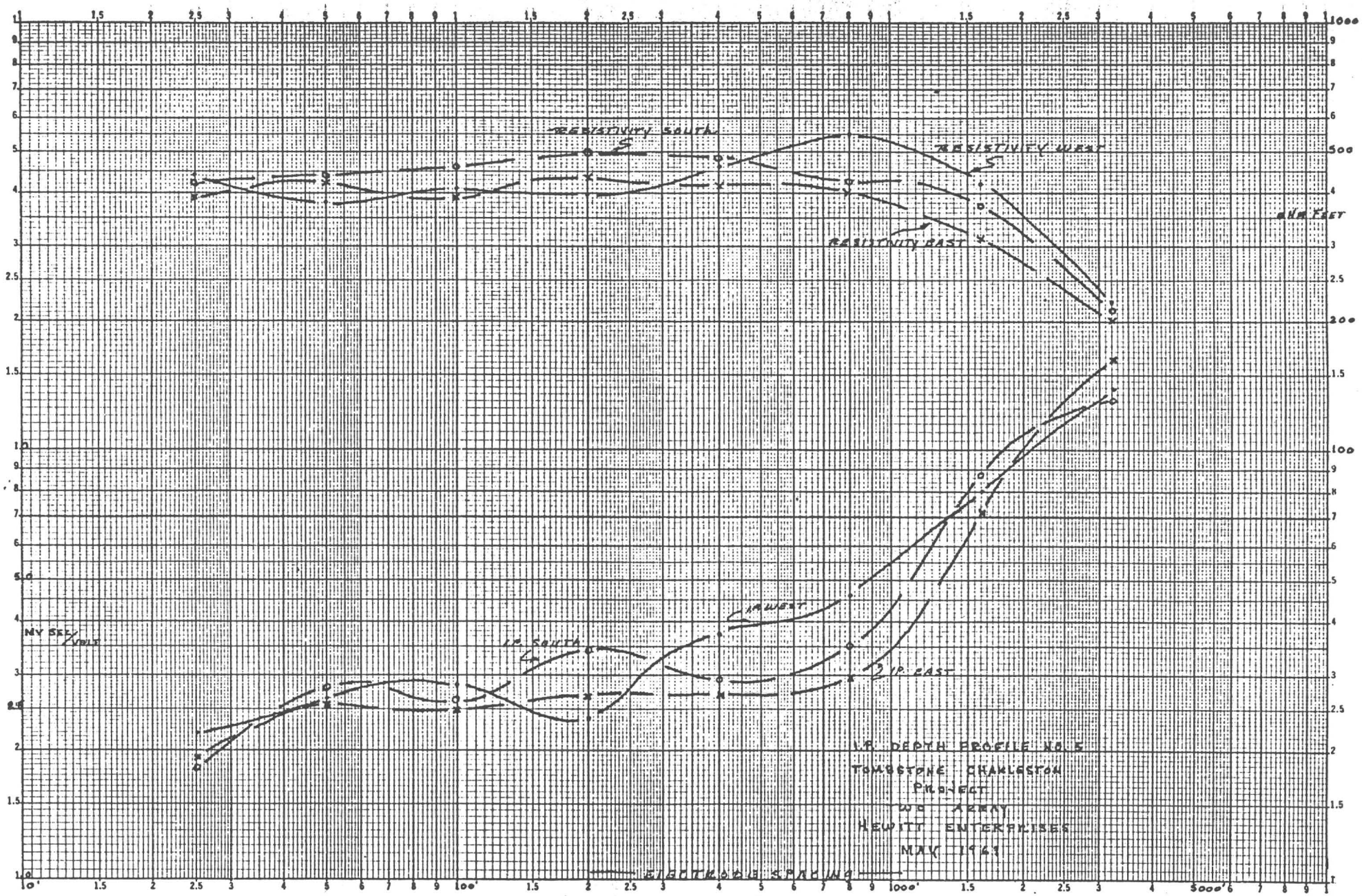
SCALE 1:24000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000



K+E LOGARITHMIC 47 7323 7 X 5 CYCLES KEUFFEL & ESSER CO.


RESISTIVITY SOUTH
RESISTIVITY WEST
OHM-FEET
MV/SEC/AMP
IP SOUTH
IP WEST
IP DEPTH PROFILE NO 3
TOMBSTONE CHARLESTON
PROJECT
TWO ARROW
HEWITT ENTERPRISES
MAY 1964
ELECTRODE SPACING
10'
100'
1000'
K+E LOGARITHMIC 47 7323
2 X 3 CYCLES
KEUFFEL & ESSER CO.


RESISTIVITY SOUTH
RESISTIVITY EAST
OHM FEET
I.P. SOUTH
I.P. EAST
MV SEC/VOLT
I.P. DEPTH PROFILE NO. 4
TOMBSTONE CHARLESTON
PROJECT
TWO ARRAY
RESULTS INTERPRETED
MAY 1966
ELECTRODE SPACING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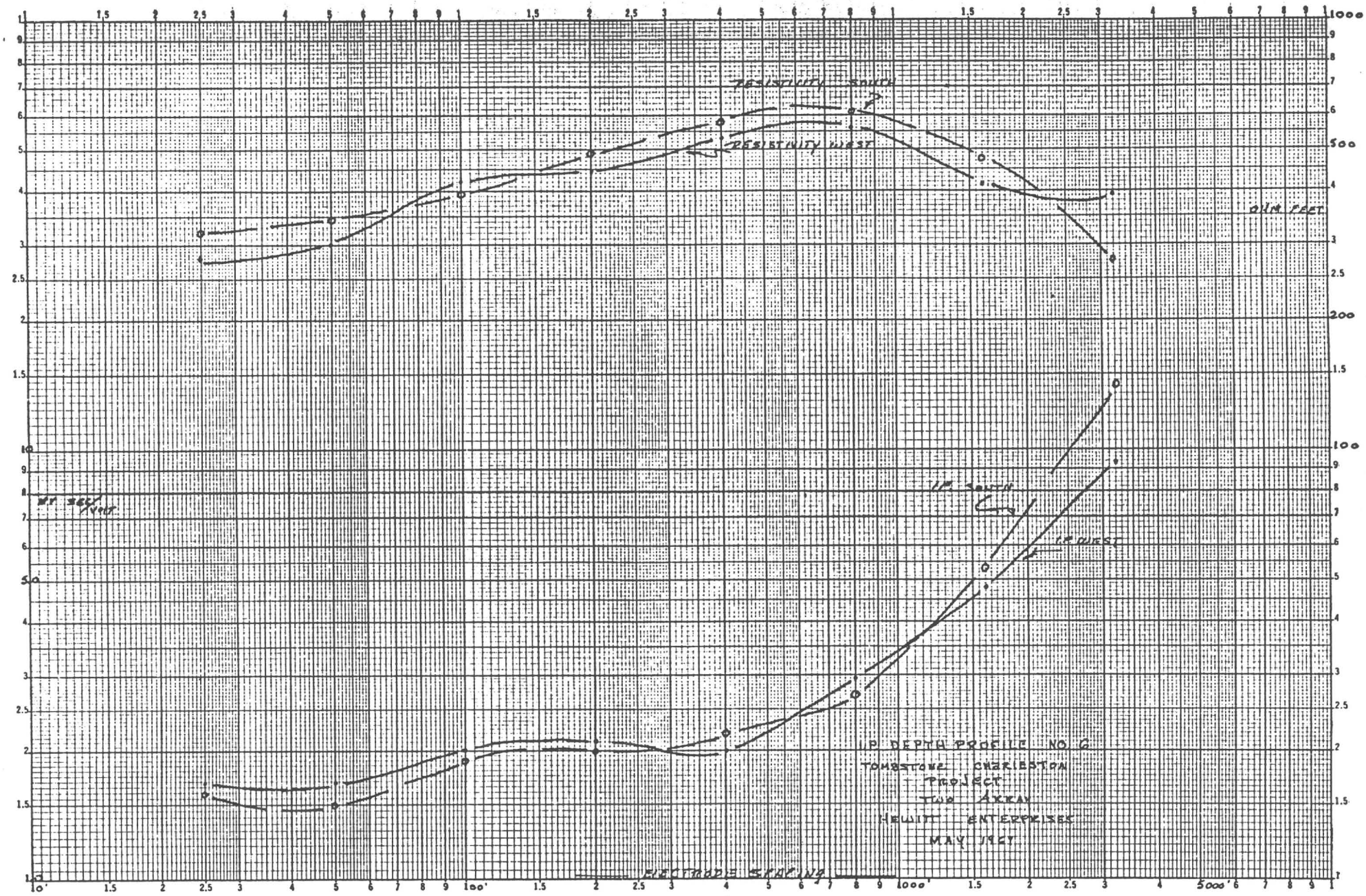
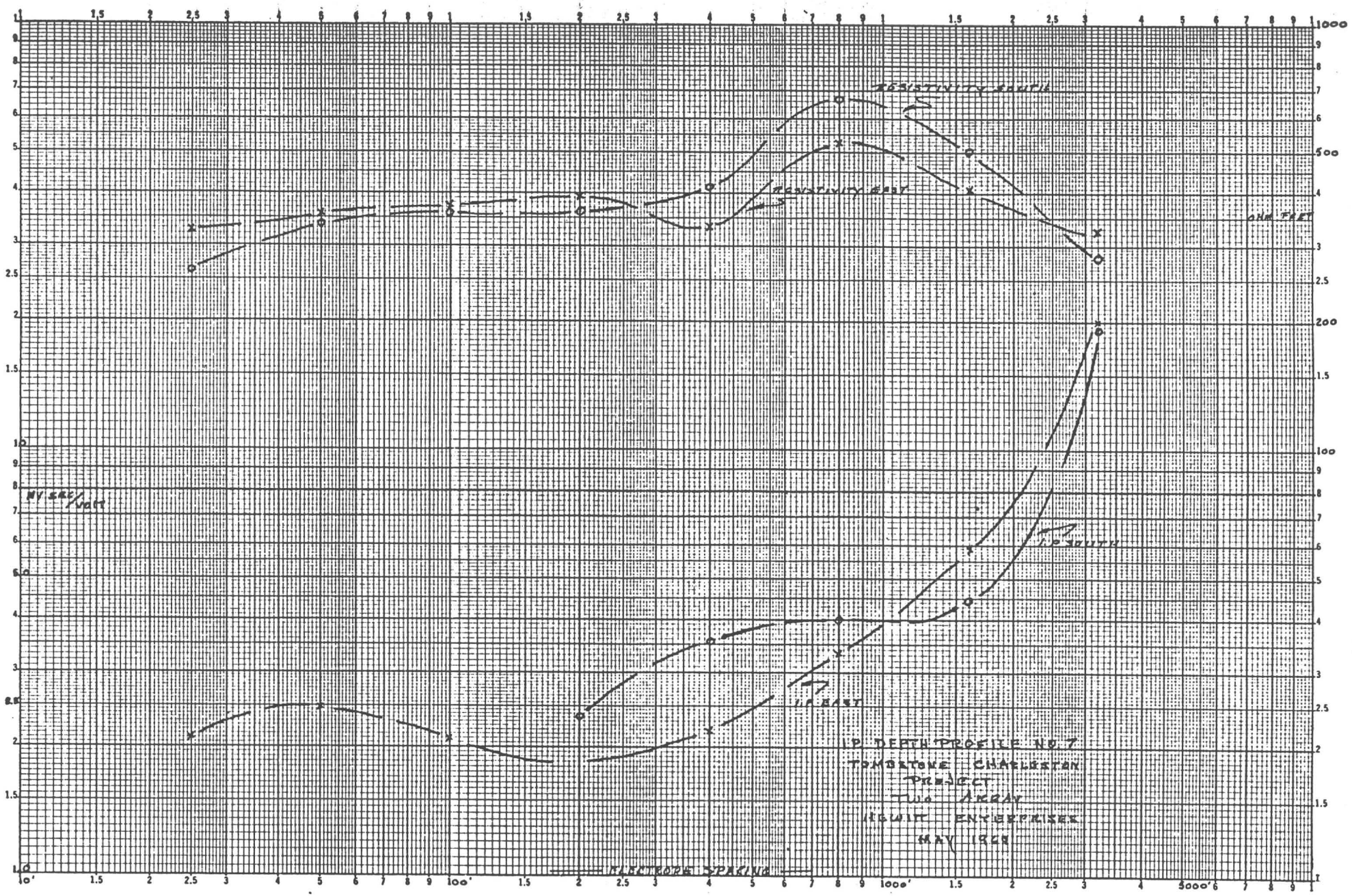
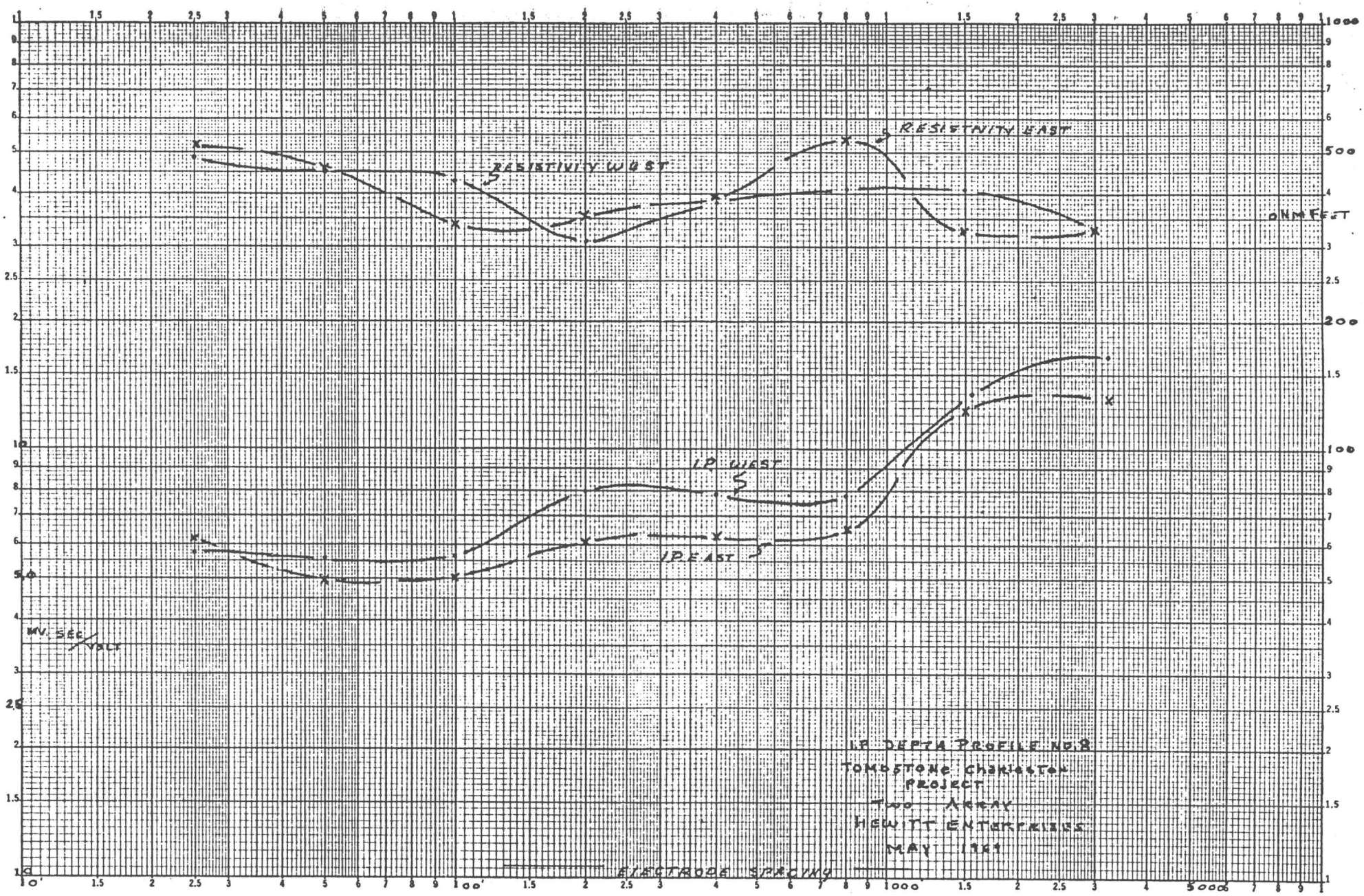
RESISTIVITY WEST
RESISTIVITY EAST
OHM FEET
MV SEC/VOLT
I.P. SOUTH
I.P. WEST
I.P. EAST
ELECTRODE SPACING
I.P. DEPTH PROFILE NO. 5
TOMBSTONE CHARLESTON
PROJECT
W.O. ACKRY
HEWITT ENTERPRISES
MAY 1969



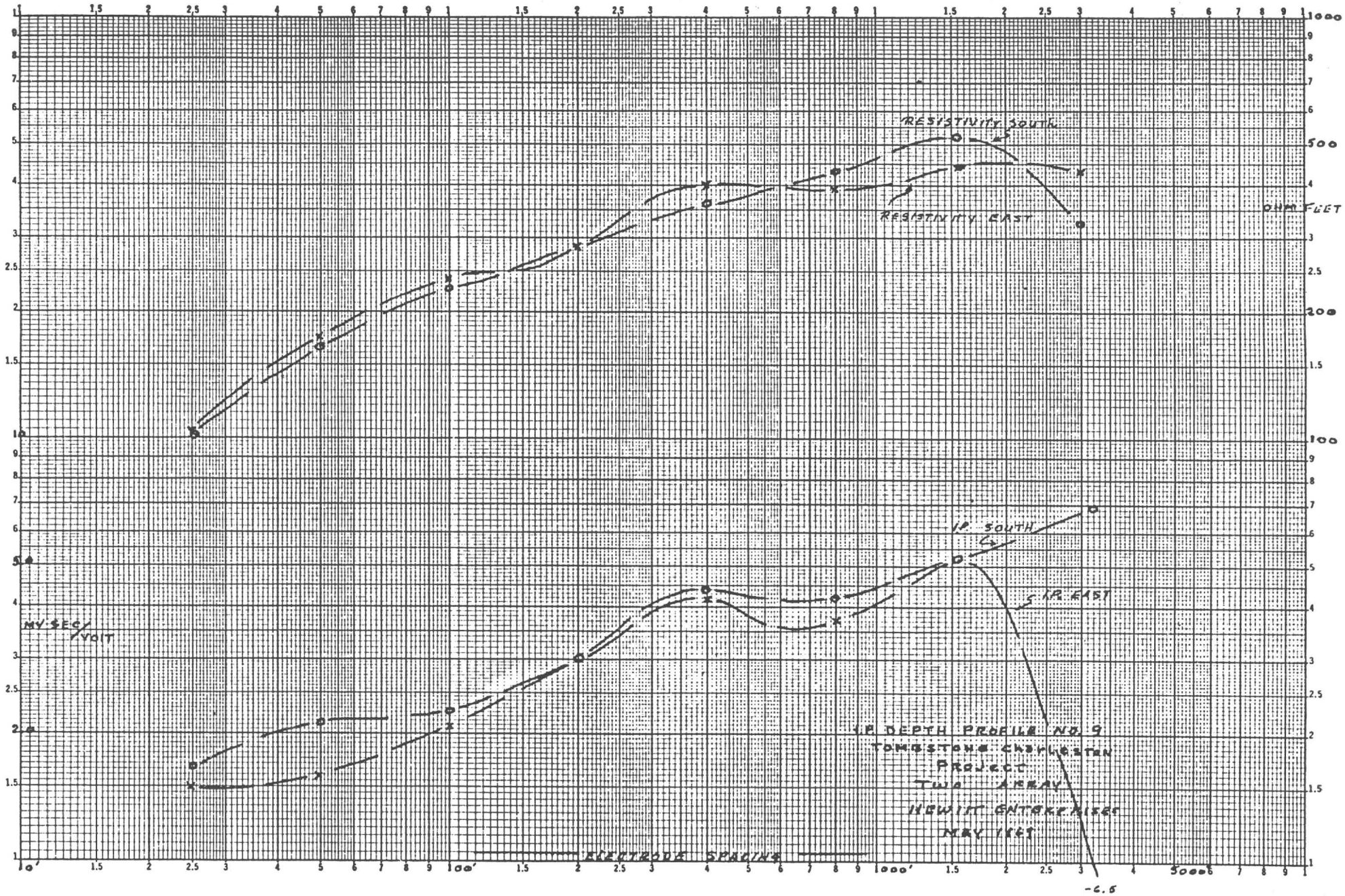
K+E 2 X 3 CYCLES KEUFFEL & ESSER CO.



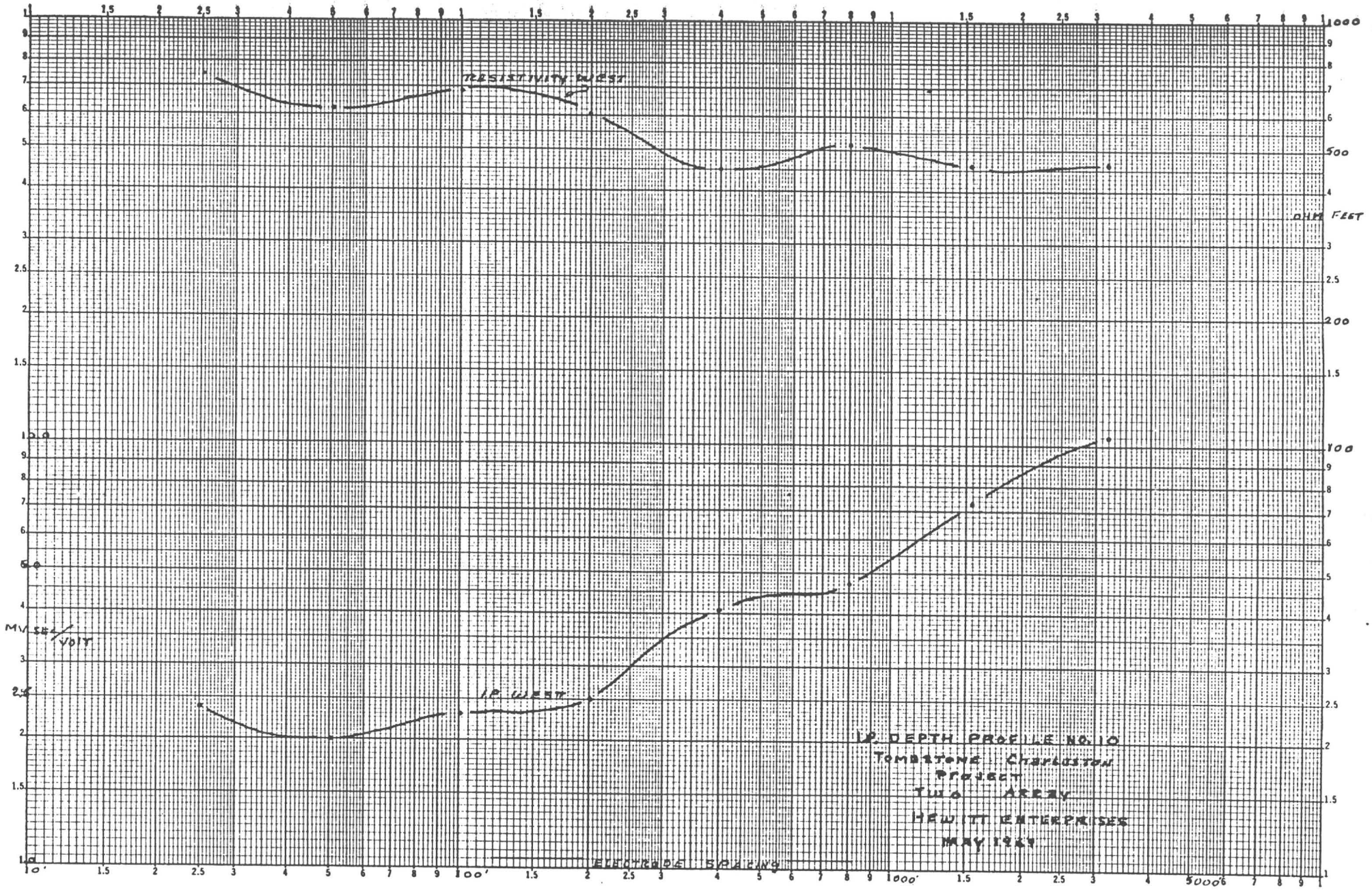
K+E LOGARITHMIC 47 7323
2 X 3 CYCLES MADE IN U.S.A.
KEUFFEL & ESSER CO.

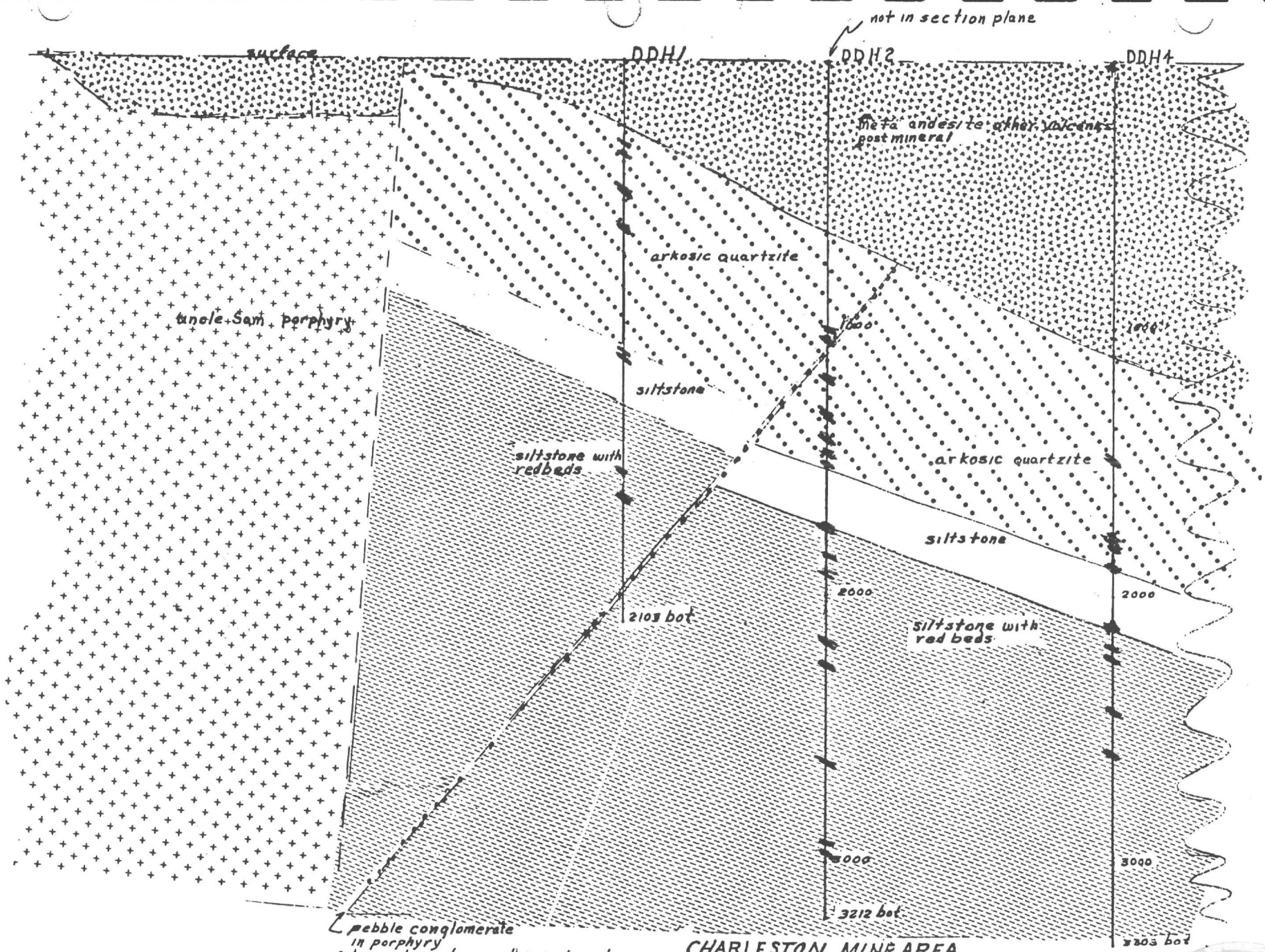


K+E LOGARITHMIC 47 7323 3 X 3 CYCLES KEUFFEL & ESSER CO.



K+E LOGARITHMIC 47 7923 2 X 5 CYCLES MADE IN U.S.A. KEUFFEL & ESSER CO.


RESISTIVITY WEST
IP WEST
OHM FEET
MV SEC/VOLT
ELECTRODE SPACING
IP DEPTH PROFILE NO. 10
TOMBSTONE CHARLESTON
PROJECT
TWO ARRAY
HEWITT ENTERPRISES
MAY 1969
K+E LOGARITHMIC 47 7323
2 X 3 CYCLES
KEUFFEL & ESSER CO.



CHARLESTON MINE AREA
very generalized
Proposed section looking N.E.
scale 1" = 500

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Cochise County Arizona

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

0-14 No Core
14-148 Fragmental meta-andesite tuff. Hematite (earthy) clay, chlorite. Coarsely fragmental to 63, then tuff to 74, then coarsely fragmental to 148
148-152 Fault zone, gouge and breccia
152-153 Fragmental tuff
153-155 Fault zone, gouge and breccia
155-180 Weathered, bleached, clay-altered tuff.
180-223 Bleached white arg. alt. medium, fragmental tuff, heavily sericitized.

50
100
150
200
250

223-227 Gouge - fault zone
227-243 White arg. alt. tuff - sericitized
243-244 Gouge - fault zone
244-254 White arg. alt. tuff - sericitized

#1

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

254-257 Gouge - fault zone

257-303.6 Graywacke, silicified, mosaic appearance, reddish. (Might be a silicified tuff) Scattered pyrite cubes. Grades to fine gray siltstone. Pyrite on seams <1%.

303.6-328.5 Gouge and breccia, heavily sericitized (313)

328.5-340 Fine siltstone, thoroughly bleached, pyritized (2-3% py), sericitized, to 340.

300

340-342.5 Gouge

342.5-400 Fine light grey to white siltstone, considerable fine qtz., sericitized. At 366, ¼" sphalerite - chalcopyrite veinlet. Pyrite 1-3%, locally up to 10%. Rock thoroughly sericitized adjacent to veinlet. Locally abundant (up to 5%) chalcopyrite. (See specimen at 371. Nx core to 400)

350

400-474 Fine granular siltstone, grey, 2-6% pyrite, very little cpy (< 0.2%) at 430, ¼" vein calcite, siderite, galena, chalcopyrite. At 440, 1" vein same.

400

474-476 Fault, gouge

450

476-525 Fine granular siltstone, pyritized (2-6% py), fragmental from 477-1/2-479, then finer grained, light grey. Two or three 1/8" vlts 482-485, sphalerite, galena, cpy. Pyrite up to 10% locally. 6" epidote zone with fine galena, sphalerite, pyrite, tetrahedrite?, 518. Several small (1/16"-1/8") vlts sphalerite. Galena with epidote to 525. Pyrite 2-6%, other

500

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

sulfides <0.1% in interval.

525-573 Conglomerate, 531-1/2-536, py - 2-6%, then fine light gray siltstone, 2-6% py calcite streaks 570-1/2-573. Sericitized.

573-574 Fault, Gouge

550

574-582 Fine gray siltstone, 2-6% pyrite. Sericitized.

582-584 Fault, gouge

584-586 Greenish gray fine siltstone, 1-2% py, becomes fine quartzite at 586.

586-649 Fine quartzite, grades to 1mm qtz locally, vuggy after 630, some py in vugs and on seams, (< 2% py)

600

649-665 Quartzite, 1mm, vuggy in part.

665-671 Fine grained impure qtz, locally with a streak or two of sphalerite, 1-2% py, <0.1% sph.

650

671-676.4 No core

676.4-705 Fine grained impure qtz, grades to 1mm at 679.5, vuggy, continues to 705

700 705-724 Qtz, 1mm, but with pyrite on seams, bulk 5-8% py, to 724

724-769 Bedding at 724, 75° to axis. Fine grained siltstone, light grey, 1-2% py. Becomes gray banded after 750, some what softer.

750

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

769-818 Fragmental (conglomerate) for about 2 feet, then splotchy, local development lime silicates. Gray siltstone with local fragmental horizon, emphasized by epidote splotches, locally fine quartzite for 5-6' intervals to 818.

800 818-824 At 818, bedding at 50° to axis. Fine banded greenish-grey siltstone (epidote and calcite)
824-824.5 Several 1/8" vlts sphalerite and galena
824.5-860 Fine green-grey siltstone, splotchy with epidote, becoming drably uniform after 842-855, then aplotchy.

850

860-886.4 Porphyry, first 18" qtz free. Altered, probably qtz monz.? Pyritized, argillic - sericite to fault at 886.4.
886.4-934 Brecciated (healed) siltstone to 892, then fine gray siltstone, becoming darker grey with depth. Some dark epidote?

900

934-971.5 Dark grey siltstone, mottled (fine mottling) to 955.5, then fine dark gray siltstone to 971.5

950

971.5-974 24" carbonate vein (not calcite), ankerite or siderite
974-1004.3 Dark grey massive siltstone grades into fine-grained arkose.

1000

ll Hole N. 1
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Cochise County Arizona

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1004.3-1106 At 1056, bedding 55° to axis. Becomes somewhat darker after 1080.

1050

1100 1106-1162.3 Fine grained, nearly quartzite, grey, gradually becomes coarser (about 1mm) at 1117. Stays coarse to 1141, then grades into finer at 1153. Fine arkosic qtz. - medium gray.

1150

1162.3-1178 Arkose, fine grained. Sericitized. Becomes fine grained at 1178.

1178-1248 Grades back into fine grained arkose after 1186. Two or three calcite bands 1207-1208. Mottled locally. 6" healed breccia at 1247.5, then porphyry.

1200

1248-1261 Meta-andesite porphyry

1250

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1261-1262 8" fault gouge

1262-1320.5 Fine massive grey granular siltstone, mottled with epidote; locally impure quartzite (hard). Becomes darker grey after 1286 to purple, 1290-1291, then 16" lime silicates to 1289.5, then purplish siltstone to 1299, then light grey grading back to purple at 1316, then grey, quartzite.

1300

1320.5-1350.5 Fine grained light grey siltstone, 1% py, some mottling, becoming medium grey with considerable mottling 1330-1336, then lighter grey with epidote patches and blobs, becoming less splotchy after 1337. Splotches end at 1350.5

1350 1350.5-1367 Fine granular impure quartzite. Grades from medium light to medium grey at 1367

1367-1482.5 Banded siltstone, some epidote banding, purplish at 1367, becomes gray and mottled, then finely mottled 1378 to 1385. Fine grained grey quartzite (impure).

1400

1482.5-1585 Fine grained light gray qtz/ (impure). Some epidote veinlets, sphalerite (¼" vein) at 1490. Grey to 1496, then mottled, fragmental looking to 1503. Fine grained grainy-looking to 1511. Fragmental to 1514, then fine grained, meta-arkose, fragmental 1524-1525. Fine grained light colored quartzite 1525-1566. 12" breccia 1566-1567 (healed). Fragmental light colored impure fine grained qtz to 1574.5

1450

1500

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1550

1585-1606 Meta-andesite-silicified.

1600

1606-1616 Mixed-meta-andesite.
1616-1630 Mixed-meta-andesite, quartzite (impure)
1630-1650 Mottled meta-arkose-fine

1650 1650-1678 Siltstone, splotchy, grey, grades to light grey at 1657. Fragmental 1662-1664. Purplish 1666-1676.5, bedding 60° to axis, contact 1678
1678-1698 Meta-andesite porphyry, several mixed zones.
1698-1746 Siltstone, purplish, to 1722, 18" fine qtz., then purplish siltstone, gradually grading to more qtz. material.

1700

1746-1757 Siltstone, fragmental (conglomerate)

1750

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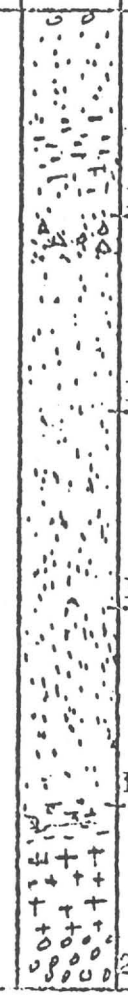
Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite	K	K Feldspar



1757-1810 Siltstone, becomes quartzitic at 1763. Fine grained impure light grey qtz.

1810-1818 Fragmental siltstone (conglomerate)

1818-1951 Light gray impure siltstone (fine qtz.), fragmental intervals, grades to 1mm qtz. at 1905, 2' basal arkose 1949-51.

1951-1954 Light colored grey siltstone
1954- 1981 Quartz latite?
1981-1998 Meta-arkose-conglomerate

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Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1998-2050 Fine grained siltstone to 2007, then 1mm qtz. to 2012, 6" cong., then arkosix qtz. (medium grained, grey) gradually becoming darker grey, more silty to 2050.

2050 2050-2103 Purplish siltstone, fragmental 2061-2068, then grey qtz. siltstone, medium grained, splotchy, to bottom. 2103

2100

2150

2200

2250

Drill Hole No. 2
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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
								0-10 No Core 10-248 Weathered meta-andesite tuff. Fragmental to 123, then fine. At 151, 4" breccia. Fragmental interval 165-168. At 181 - bedding 30° to axis. To 189.5, fragmental to 197. Bedding at 199-65°. Fine to 209, fragmental to 248.
								50
								100
								150
								200
								248-394 Fine to 262, fragmental to 270, fine and fragmental mixed to 278. Tuff to 323. Fragmental 323-327, fine to 329, fragmental to 394.
								250

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type		
								300	
								350	
								400	394-506 Meta-andesite tuff-coarsely fragmental, bedding at 442 50° to asix to 437.5, bedded tuff to 453, then fragmental to 506.
								450	
								500	

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type		
									506-534 Meta-andesite tuff - fragmental in part to 527, strongly fragmental to 534.
									534-537 Meta-andesite, bleached, some sericite, fault zone at 536.
									537-566 Meta-andesite tuff to 566.
								550	566-567.5 Gouge and breccia - fault zone.
									567.5-577.5 Fine grained meta-andesite tuff.
									577.5-578.5 Gouge and breccia - fault zone.
									578.5-582 Fine grained meta-andesite tuff.
									582-591 Fragmental meta-andesite tuff.
									591-598 Bleached meta-andesite sericite, specks of galena, some silicification, argillic alt. FeOx stain.
								600	
									598-603 Crushed zone, clay, sericite.
									603-604 Bleached meta-andesite.
									604-605 Fault Zone.
									605-623 Crushed and broken zone, bleached meta-andesite tuff 40° dip to axis (fault).
								650	623-628 Bleached meta-andesite.
									628-675.5 Sericitized meta-andesite tuff, grading downward to shloritic meta-andesite tuff.
									675.5-699.5 Andesite tuff (?)
									699.5-737.5 Meta-andesite tuff (see specimen at 706.5) dark gray, fine grained, feldspars altered, ferromags altered to chlorite, could also be a meta-volcanic tuff. Splotches of epidote. Epidote bands may reflect bedding? (40° to core) On the whole, prefer to consider this a tuff. Some fine pyrite with epidote. Small fault, 4" gouge and breccia at 724.
								700	
								750	737.5-761 12" gouge fault at 30° to axis of core. Meta-andesit tuff, intercalated bands fine grained medium gray siltstone

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

after 741. Crushed zone, 760-761, thereafter gray siltstone.

761-770 Arkose, granular nondescript, specked with fine pyrite cubes. Sercite

770-781 Coarse conglomeratic arkose to 779.5, fine grained light gray siltstone to fault at 781. Bedding at 85° to axis.

800

781-783 Gouge and breccia, some fine pyrite.

783-912 Quartzite, light grey, medium grained, sericite. Becomes fine grained after 869 to 877.5, then medium again to 912. At 911, bedding 56° to axis.

850

900

912-1005 Fine grained gray siltstone

1005-1007 Fine grained quartzite with sphalerite, galena, and pyrite, about 5% total sulfide.

1007-1015 Quartzite, medium grained, light grey

1015-1052 Siltstone, some fine qtz (1/16" veins sphalerite 1019-1020) to pyrite veinlets to 1028, then two or three 1/8" sphalerite veinlets. Siltstone to 1031.5. Quartzite with two or three 1/16" sphalerite veinlets to 1034, then darker gray fine grained siltstone, becoming lighter to 1039, medium grained arkosic qtz. after 1039 to fault zone 1052-1056.

950

1000

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1052-1056 Fault zone

1050

1056-1094 Arkose, in part conglomeratic with pebbles up to 3/8" to 1070, then pebbles become larger to base at 1094.

1094-1102 Fine grained gray arkosic siltstone, locally medium grained quartzitic. 1/8" band pyrite and sphalerite at 1099. Fine grained to 1102.

1100 1102-1118 Meta-andesite (?) dike. Thoroughly altered prophyritic dike. Chilled border about 18" 1102-1104, then stony groundmass, epidote alt. of feldspars, chlorite. At contact at 1118, 2' mixed rock, contact irregular, welded at 30° to axis.

1118-1173 Fine grained gray arkosic rock grades into gray quartzite. An occasional 1/16 vlt of sphalerite and pyrite. Tot sulfide per any 10' int. < 0.1%

1150

1173-1187 Changes from grey to light grey at 1173-1175, then conglomeratic and somewhat mineralized from 1175-1187. Vuggy, some calcite, sphalerite, galena. Perhaps 2-4% total sulfide.

1200 1187-1196.5 Fine grained silicitized arkose

1196.5-1202 Sericitized arkose (?) speckled with galena, pyrite, and sphalerite, total sulfides about 4-6% to 1200.

1202-1249 Quartzite, fine grained, light gray, grades to medium grained.

1250

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1249-1280 Fine grained light gray arkose-has stony look, not much quartz. Beddings locally present, one at 1262.5 40° to axis. Rock becomes mottled 1270.5-1275, then gray granular (about 1mm), grading into quartzite at 1280.

1280-1330 Quartzite to 1281, then back to granular gray arkose, as above, rock gradually becoming more quartzitic, fair qtz. after 1301.

1300

1330-1363 Arkose, dense granular to 1332, then fine grained siltstone with minor sulfide on bedding (less than 1$ sulfide), to 1334. Quartzitic arkose to 1347.5, then gray granular arkose to 1349.5, then quartz-ark. to 1363.

1350 1363-1368.6 Fine grained gray siltstone.

1368.6-1395 Quartzite with sericite, occasional grain of galena or pyrite. At 1397, 10" altered (bleached) shale and qtz. bedding 45° to axis.

1395-1410 Disseminated sulfides in qtz. after 1397. ½" py vein at 1401, 25° to asix, 1% total sulfides to 1405, then 5%> to 1406.5 then 1% again. Sulfides are galena, sphalerite, minor cpy and pyrite. Sulfide content drops to much less than 1% with rock change (1410).

1400

1410-1416 Dense greenish massive lime silicate rock (diopside?) specimen at 1409-Possible fault at 1416-no gouge but badly broken core.

1450 1416-1457.5 Dense light gray fine grained quartzite. Minor py on seams 1% sulfide. Quartzite gradually becomes coarser, about 1mm at 1454, sulfide content picks up to 2-3%, mostly galena and sphalerite for interval 1454-1457.5

1457.5-1477 Dense light gray fine grained quartzite (sericitized At 1477, bedding plane 50° to core. Sulfide < 1%.

1500

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Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

siltstone at 1748. Purplish siltstone to 1759, then back to dense, fine to coarse cubic pyrite. Minor lime silicate veining. Gray to 1803 then purplish to 1811, then gray as above. Somewhat coarser 1813-1818, denser 1818-1820

1800

1820-1852 Siltstone, dark gray 1820-1831, then light gray 1831-1837, 1mm quartzite 1837-1839, then purple siltstone followed by dull stony quartzite(?) at 1843 - granular. (probably lime silicates) to 1850, then fine grained siltstone to 1852

1850

1852-1853 Arkose? with sphalerite and cpy < 15% sulfides

1853-1923 Quartzite, 1-2mm, becoming finer grained, more stony looking. Minor sphalerite-galena, up to 5% for 4" interval, otherwise negligible (less than 1%). Fine grained gray qtz to 1865, then purplish siltstone to 1875. Lighter colored to 1878.5, then purplish again to 1892. Dense light gray 1892-1897.5, purplish to 1901. Lime silicates vlt at 1901 (½", 5% sulfide, mostly sphalerite). Fine grained light gy to 1905.5, becomes granular (fine) more quartzitic to 1923.

1900

1923-1924 Arkose, heavy sphalerite, galena. About 10% Z, 3% lea 15-20% total sulfide.

1924-1935 Quartzite with less than 1% sulfide to 1925, then purplish siltstone, becoming dark gray at 1927, then light greenish gray lime silicates with minor py (2% sulfides) to 1928.5. Dark gray siltstone grading to purple siltstone, then to greenish dense lime silicates to 1935.

1950

1935-2002.3 Dense, fine gray siltstone to 1939, greenish gray lime silicates to 1939.5, purplish dense siltstone to 1943.5

2000

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1477-1512 Quartzite-medium grained (less than 1lm but granular) Sulfide < 1%.
1512-1518.5 Fault zone, minor gouge, poor core
1518.5-1532 Quartzite, somewhat silicified.
1532-1533.6 12" heavy pyrite
1550 1533.6-1543 Quartzite, about 1mm, broken
1543-1546 Gouge and breccia - barren
1546-1594 Purplish siltstone to 1549, then bleaching to gray with lime silicate spots, grading to quartzite at 1552. (Fine grained-gray)
1594-1625 Gray siltstone, scattered blebs of py, changing color
1600 to lt gy and from siltstone to fine qtz with lime silicate streaks at 1601
1625-1727 Dense gy silicified siltstone, blobs of lime silicate minerals, some scattered py, still much less than 1% sulfide This silicified siltstone has a porphyritic look with the quartz grains separate in a dense stony groundmass. Silt-
1650 stone persists to 1725, then changes to medium grained quartzite, to

1700

1727-1733.5 1-2mm quartzite-sericite, from 1-5% total sulfides, sphalerite, cpy, py, minor galena.
1733.5 6" fault gouge
1733.5-1820 Quartzite, dense, fine grained, py cubes, less than
1750 1% sulfide. Changes from gray to reddish, becoming purplish

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type		
									then gray to light greenish gray lime silicates to 1969, the gray to light gray (some lime silicates) to 1996, then purplish siltstone to 2002. At 2002 3" light gray core. Minor py veining in gray and green gray lime silicate rock <1% sulfide.
								2050	2002.3-2027 Dense fine grey siltstone, grades to purplish siltst at 2014, then to fine grey siltstone at 2027.
									2032 Qtzite gy silty
									2045 Siltstone - val mud? gritty bxt'd buff gray to purplish gy
									2082 Siltstone - lithic mud fg tuff not unlike pre entys but more varigated occ flow? banding
								2100	
									2102 Qtzite - fg silty gy green grades from pre enty to better looking qtzite at bot
									2157 Siltstone - fg tuff bxt'd occ lg incls and fine frags not a
								2150	muddy looking as pre thin (1/16") high veins of sphal occ present the sequence from 2045 seems to be more tuffacious than the previous runs of siltstone (from 2145 call it good tuff)
									2165 Ditto
								2200	
									2212 Silicified contact bx gy altd rock, prob tuff
								2250	

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

0-852 Meta andesite

50

100

150

200

250

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
								300
								350
								400
								450
								500

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
								550
								600
								650
								700
								750

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	Depth	Description
								800	
								850	852-941 Meta andesite, with calcite stringers
								900	
									941-948 Fault gouge
								950	948-1080 Meta andesite breccia; fragments of andesite, quartzite red siltstone and arkose. Arkose contains minor diss py.
								1000	

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	Alteration
								Sericite, Kaolin, Silica, Chlorite; Garnet, Serpentine, Biotite, K Feldspar

1050

1080-1106 Arkose with less than 1% finely diss py (minor epidote stringers at 1100-1104)

1106-1130 Fault gouge - epidote on fractures

1100

1130-1133 Siltstone
1133-1134 Arkose, banding 50° to core axis, possibly bedding
1134-1137 Red siltstone
1137-1156 White quartzite, very minor diss fine grained py

1150

1156-1159 Quartzite breccia, gougy with inclusions of porphyritic rock
1159-1162 Quartzite
1162-1167 Quartzite breccia with angular fragment of porphyry, gougy material with sericite
200 1167-1210 Porphyry, highly altered with much sericite and clay, 1167 to 1185 brokern with much gouge, py more abundant in gouge zones
1210-1222 Arkose, .5% py, crushed zone
1222-1229 Porphyry, 1% py altered with some sericite
1229-1277 Fine ground white quartzite with very minor diss py, 1% banding 50° to core axis

1250

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Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1277-1307 Fine grained gray hornfels, very little quartz. Rock mottled 1284-1292, fine grained py diss throughout, approx 2%, grades into quartzite

1300

1307-1326 White qtzt, fine grained, very minor diss py, 1% or l
1326-1391 Arkose, crushed zone 1331-1336, healed fault zone 30° to core axis at 1332, mottled and fine grained 1357-1359, mottled and fine grained 1388-1391, Diss py-.5%

1350

1391-1398 Arkose, minor diss py -.5%
1398-1402 Crushed zone with clay and sericite, diss sulphides, minor sphalerite - 3% total sulphide

1400

1402-1424 Arkose, grades to qtzt at 1424
1424-1455 Qtzt, grades to arkose at 1455

1455-1487 Arkose qtzt, 1478-py, galena, sphal and cpy diss through the rock, spal 20%, galena 2%, cpy 1%. 1479 1" solid galena and sphal; 1480-1481 gouge with sericite; 1483-1484 gouge with sericite; 1480-1481 diss sphal and py, 5% sulphides

1450

1487-1494 Stony arkose or qtz, strong silicification, diss py-5
1494-1496 Same

1500 1496-1498.5 Mottled arkosic qtzt mineralized 5%-10% py some chlorite

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Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1498.5-1501 Qtz andesite - porphyry highly altered some sericite w/chlorite and sulphides 5% py 3% gal. 5% sphal

1501-1590 Porphyry broken and altered but less sericite, more chlorite, sulphide, mostly py-1% mineralized plus 3% sulphide some sphal and gal 190-191, several ½" stringers, minerals 10° to core axis

1550

1590-1688 Greenish grey tuffaceous qtzt, 3% sulphide 1590-1591; badly broken and gougy 1594-1598; fractures 10° to core axis calcite filling on fractures. Some epidote and chlorite? Mottled, 1611-1612 no core, 1612-1616 60% core, 1612-1616 chlorite with 2% py 1% galena 2% sphal .5% cpy; 1626-1631 grades to siltstone, 1631-1636 highly silicified, quarts and epidote stringers 10° to core axis. 1636-1643 badly broken with some sericite. 1626-1688 silicified pink colored tuff. 1663-1665 gouge and broken, badly broken and gouge 1672-1713

1600

1650

1688-1726 Coarse grey qtzt, some chlorite, py 2%, sericite and clay in gouge zone. 1727-1730 minor diss sphal, galena

1726-1745 Grades back into silicified pink arkose

1700 1746-1747 White quartzite

1747-1762 White qtzt ground to powder

1750

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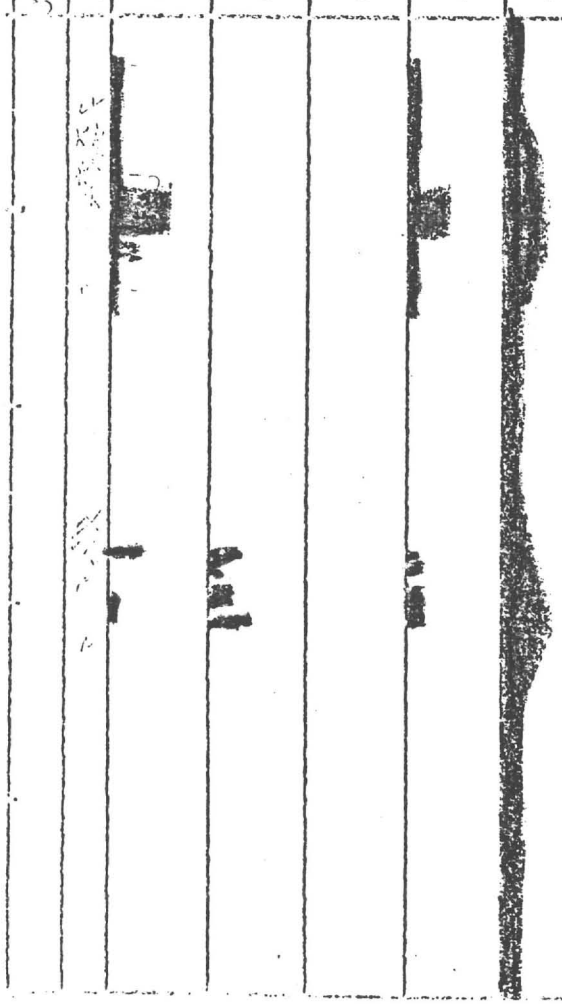

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

1762-1773 Grades from quartzite to andesite porphyry, very soft and highly altered, some chlorite, 5% py, .5% cpy.

1773-1791.5 Andesite porphyry, green altered feldspars, some introduced pink K feldspar?

1791.5-1802 Mineralized zone, originally arkosic quartzite or greywacke primarily cpy 10-15% average. Minor galena and sphalerite

1800

1802-1812 Arkosic quartzite, 1802-1803 20% core recovery, gouge 1806-1810 60% core recovery, 3% sulphides mostly py, 3% diss cpy 1810-1812

1812-1822 Quartzite with diss 5% cpy, minor galena and sphal

1850

1822-1824 Arkose with numerous calcite stringers 2% sulphides mostly py

1824-1831 Quartzite, 2% sulphides, mostly py

1831-1833 Quartzite, light grey, 1-2% py, silicified vein 6" widt sphalerite and lead, 5% sulphides

1833-1854 Silicified arkose, purple and coarse grained with diss galena and sphal, 1852.5-1853.5, 6% sulphides

1900

1854-1871 Arkosic quartzite, light gray to light purple, py .5%

1871-1874 Broken fine grained gray qtzt, with 1% py, minor sphal specks, some chlorite blebs

1874-1882 Light gray qtzt, py filled fracture 45° to core at 187 sulphides -.5%

1950

1882-1895.5 Gray quartzite, diss py and sphal 1% sulphides, chlorite in last one foot.

1895.5-1903 Mineralized arkosic qtz which appears to be almost porphrytic with introduce chlorite (cpy, sphal, py) 5-6% sulphides

1903-1906 Dark gray very fine grained tuffaceous sandstone with blebs of olivine, diss sulphides, mostly py 3-5%

2000

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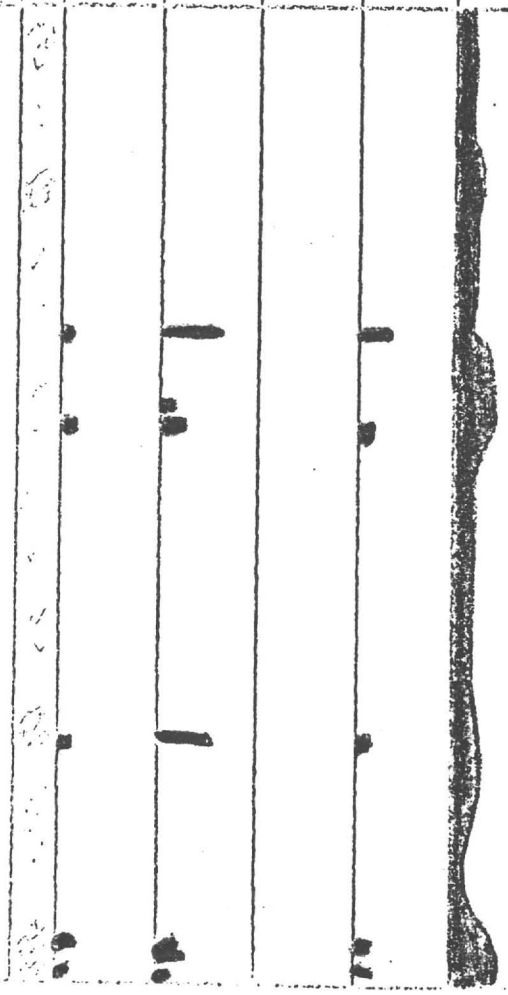
Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar



1906-1939 Brecciated & cemented arkosic qtzt very much mottled w/chlorite, olivine. Rock appears pink, py -.5%. 1920-192 very dark gray siltstone silicified with 2% py. Very high altered and bleached.

1929-1957 Light gray qtzt, 1938-1940 similar to pre section, sulphides .5%, blebs of olivine surrounded by chlorite

2050

1957-1969 Highly altered arkose? with much sericite and minor chlorite highly bleached, banding 50° to core axis, diss sphal at 1963, 6" minor py in section -.5%

1969-2001 Very similar to section from 1906-1929, broken with sericite 1978-1979, 1" sphal vein 15° to core axis at 1998 py approx 1%

2100

2001-2003 Very dark gy-wacke, 3% py, minor specks of cpy

2003-2072 Lt gy arkosic qtzt, py -.5%, 10% py 2023-2026, 2034-2041 finer grained with more py and more highly altered, 1% py, fault zone with sericite, 2044-2046. Fault gouge 2053-2054. Strong alteration 50° to core axis at 2071.

2150

2072-2196 Siltstone, strong silicification w/olivine blebs and minor chlorite patches, some sericite; Arkose 2090.5-2094; 2097.5-2104 healed breccia, mineralized zone, with introduce quartz phenocrysts, 1.5' core lost, 10% sphal, 2% cpy 5% py; 2101-2104 30% core recovery; 2123-2124 core is deep purple colored with white splotches; 2161-2181 core badly broken with much sericite; mineralized arkose, sphal 6%, cpy 2%, py 8%, 2183-2190, one foot core missing; 2190-2196 broken with sericite.

2200

2196-2225 Purple siltstone, bleached and broken with sericite 2198-2206, very dark purple 2214-2223

2225-2242 Arkosic qtzt lt gy becomes porphyritic 2241 some sericite development near porphyry contact. Mineralized zone 2230.5-2236, sphalerite 4%, cpy 1%

2250

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Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2242-2290 Andesite porphyry, 2249-2250 test for sphal. Mineral porphyry silicified altered with gouge and cpy 2% sphal 3% py 5%, sericite 30% core recovery, 2276-2283. 2277-2283 only 2' core recovered.

2290-2313 Arkose 2290-2291, 2" salmon colored igneous veinlet 10° to core axis at 2290, looks aplitic; quartzitic 2300-2309.

2300

2313-2334 Very fine grained gray silicified hornfels with minute angular quartz crystals as eyes look slightly oplitic from 2329-2334, becomes arkosic about 2330.

2334-2336 Dark Purple arkose, white splotches.

2336-2354 Purple siltstone, white lime silicates splotches. Grades to gray arkose at 2347 grades to gray arkose

2350

2354-2362 Gray arkose becoming very white quartzitic arkose at 2356, becomes gray arkose at 2358

2362-2377 Siltstone, gray to 2364 then purple to2377

2377-2384 Lime silicates with epidote splotches

2384-2387 Purple siltstone

2400

2387-2398 Greenish gray very fine grained silicified arkose ribbon rock or serpentinized 2392 grades into pink fine grained silicified arkose grades to gray 2394 -1% py.

2398-2408 Purple siltstone py -1%

2408-2413 Light gray to light purple arkose

2413-2472 Chlorite & epidote present. Lime silicates, considerable sericite, 10" sphal vein 30° to core axis 2438 gray arkose with sericite 2455-2456, 6" mineralization 2459, 3% sphal 3% cpy, 6' mineralization 2465 2% sphal 3% cpy overall py plus 1%

2450

2472-2487 White silicified tuff, 20% core recovery 2476-2487

2487-2497 Banded grayish purple siltstone grading to qtzt 2489-2497

2500

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Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2497-2510 Gray arkosic qtzt mixed. 6" sphal at 2500 3% sphal.
2510-2559 White arkosic quartzite with sericite fairly well broken 2% py.
2559-2575 Light gray lime silicates and qzt, grades to gray arkosic qtzt
2550 2575-2613 Light gray arkosic qtzt & tuff, with purple bands 30° to core axis, 4% py, gouge zone 2578-2579, mineralized 2597
2613-2643 Light gray qtz, 5% py, white splotches

2643-2680 Tuff, gray to 2653 then changes to white arkosic qtzt to 2669 then gray qtzt to 2673 then grades to highly bleache tuff 2680, 8% py.
2600
2680-2693 Fine grained bleached arkosic qtzt, mineralized zone mostly py 5-8% 2691-2693 brecciated with sericite some cpy -.2 average 2% py.

2650

2693-2699 Andesite porphyry py -1%
2699.5-2705.5 Mineralized zone brecciated with much sericite, 50% core recovery split, py 5%, minor diss cpy and sphal.
2700
2705.5-2712 Gray fine grained silicified qtzt, by 3%, very minor specs cpy.
2712-2743 Very fine grained silicified qtzt grades from white to gray containing py 1% with minor sphal argillaceous in spots. Brecciated and healed pink quartzite healed fractures 20° to core axis, py not present 2717-2722 white argillaceous qtzt
2750
2729-2740

[redacted] Project [redacted] Page [redacted]

Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Cochise County Arizona

Scale
Started
Completed

By

Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

2743-2755 Light purple arkosic qtzt. Sulphides oxidized limonit on fractures 1' cpy and sphal 2754' Cu -.5 Zn 2.0

2755-2781 Light pink to purple siltstone purple 2758-2767. All oxidized. 6" mineralization 2768 (split) bleached hornfels 2769-2781. Splotches of epodite and chlorite

2800 2781-2802 Argillaceous quartzite grades to purple siltstone at 2788-2791, mineralized 1' 2784 (split) Bleached with splotches of epidote. Bleached siltstone 2791-2797. Purple siltstone 2797-2802

2802-2824 Bleached fine grained arkosic qtz

2824-2840 White coarse grained silicified arkosic qtzt. Very minor specks black mineral possibly bornite

2850 2840-2852 Fine grained siltstone bleached

2852-2889 Coarse grained white qtzt and tuff, sericite present, minor black specs present. 2882-2885 siltstone dark gray in color 2881-2884 contains 2% py.

2889-2929 Light gray arkosic qtzt banding 40-50° to core axis grades to silicified lime 2895-2929

2900 2929-2958 Bleached siltstone with sections of lime silicates, purple siltstone, large patches of epidote

2958-2973.5 Light gray, fine grained tuff

2973.5-2981 Very coarse grained greenish gray tuff and qtzt. Mineralized slickenside at 2973.5

2950 2981-3001 Bleached siltstone, white to purple same as 2929-2958

3001-3018 Find grained gray arkosic qtzt. Coarse grained 3011-3018

3000

Drill Hole No. 4
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

By

Sample Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	Depth	Description
									3018-3100 Bleached siltstone white to purple numerous slikensides some sericite present, same as 2929-2958, numerous broken zones
								3050	
									3100-3119 White arkosic quartzite
								3100	3119-3242 Bleached siltstone white to purple some dark gray argillite same as 2929-2958. 3232-3234 borinite and cpy.
								3150	
								3200	
									3242-3293 Arkosic quartzite, minor specs of black mineral with green (borinite not copper)
								3250	

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite		K Feldspar

Drill Hole No. 4
Collar Elevation
Coordinates
Bearing
Depth
Inclination 90°

Charleston Project
Cochise County Arizona

Scale
Started
Completed

Page
By

Core Recovery	Alteration	Chalcopyrite	Sphalerite	Galena	Ag	Pyrite	Rock Type	
								3293-3301 Bleached siltstone white to purple same as 2929-2958
								3300
								3301-3303 Brecciated and calcite filled arkosic qtzt. Beginning of sulphide zone again 6" cpy at 3303
								3350
								3400
								3450
								3500

Alteration

	Sericite		Garnet
	Kaolin		Serpentine
	Silica		Biotite
	Chlorite	K	K Feldspar

GENERALIZED DESCRIPTIVE LOG

Charleston Lead Mine | Cochise County | James Stewart Construction Co.

HORNE(STEWART)#5 DRILL HOLE

0-12	No core	
12-369	Graywacke, gray, very fine-to coarse-grained, bedding 50°, locally very thin bedded, shaley, locally arkosic, volcanoclastic, and/or conglomeratic. Clasts up to 2" diam.	
	91-155	Conglomeratic 50% fragments of sediments and volcanics
	166-173	Fracture zone; 166-167 red gouge remainder is broken core and gouge argillic, chloritic, Fe oxide
	173-182	Conglomeratic, 70° fracture, argillic
	191-203	Fracture zone, gouge and broken core, moderate Fe oxide, strong argillization
	203-211	Calcite and clay stringers
	211-213	Fracture zone
	213-219	Weak Fe oxide
	219-221	Fracture zone, gouge
	239-259	Conglomeratic, clasts up to 2" diam., locally well broken
	259-369	Massive, dark graywacke, high angle kaolin stringers
	304-305	Pyritic, leached
	328-329	Gouge zone, local calcite-quartz stringers
	330-	15° fracture with drusy quartz
369-390	Andesite, dark green-gray, porphyritic-aphantic; feldspar phenocrysts up to 1 cm. Argillized, kaolinized, bottom on 50° fracture	
390-537	Graywacke as above, kaolinized, fractured, Fe oxide in fractures	
537-551	Breccia, maroon, arkosic, shaley, with clasts of graywacke up to 2". Clay along fractures, minor pyrite	
551-837	Graywacke as above	
	551-566	Light gray pyritic rock, 1% pyrite, very fine-grained; calcite stringers, bleached, argillized
	566-568	Fracture zone, finely broken, gouge
	568-582	Dark gray graywacke conglomerate, clasts of shale, graywacke, volcanics drusy calcite on fractures, kaol. on slips
	637-638	Fault zone 20°
	651-677	Bleached, pyritic 0.5-1% pyrite, possible galena traces in fractures drusy calcite and broken core at 665
	677-728	Arkosic graywacke conglomerate
	728-730	Broken core
	745-753	Bleached .5% pyrite on fractures
	763-774	Bleached, pyrite

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	775-804	Irregular disseminated pyrite up to 3%, epidote	
	821-837	Disseminated pyrite, argillic-intensity increasing toward bottom, abundant clots of epidote up to 1" diam.	
837-921	Alternating graywacke and light gray porphyritic andesite		
	837-840	Andesite, phenocrystic plagioclase up to 2 mm, local clots of epidote and magnetite	
	840-844	Graywacke	
	844-846	Andesite	
	846-850	graywacke	
	850-853	Andesite	0.1-1% disseminated pyrite
	853-862	Graywacke	
	862-864	Andesite	
	864-873	Graywacke	
	873-875	Andesite	
	875-902	Graywacke: baren	
	902-903	Andesite	0.1-1% pyrite, trace chalcopyrite increasing with depth to 2% pyrite
	903-916	Graywacke, 909-912 gouge	
	916-921	Andesite	
	921-936	Graywacke, galena stringer at 930	
936-947	Graywacke (?) thoroughly argillized, pyritized, pyrite 1-3%, galena stringers		
	938-940	Gouge	
	944	Bleb 5-8% pyrite, specks of sphalerite	
947-1398	Graywacke, dark gray, fine-grained, pyritic		
	947-957	Calcite and pyrite stringers (2% pyrite), chloritized, bleached coarse euhedral pyrite	
	957-975	1-3% disseminated pyrite	
	975-985	Conglomeratic, tarnished pyrite decreasing to 1%, epidotization increasing with depth	
	1007	1-2% irregular pyrite	
	1017-1026	Intense alteration, pyrite 4-6%, blebs of sphalerite and galena stringers of galena-pyrite-epidote, trace chalcopyrite	
	1026	Weakly chloritized, 1-2% pyrite	
	1041	Fracture zone 20°, bleached 1' both sides, veins of quartz-calcite-epidote-galena-sphalerite	
		Below 1041 irregular steep quartz-calcite-pyrite-chalcopyrite-galena stringers. 1-3% disseminated pyrite	
	1065-1067	Fracture zone; quartz-calcite-pyrite-chalcopyrite-sphalerite-galena strings. Galena weakening	
	1080	All stringers weak. 3% pyrite decreasing with depth disappears at 1100	
	1107	0.5% pyrite increasing with depth	
	1115-1117	Fracture zone; broken core and gouge	

1117 Intense alteration or thermal metamorphism
1139 Pyrite decreasing with depth
1143 Chloritic hydrothermal alteration; trace galena
1147-1149 Fracture zone
1154 Fresh rock
1156 Thermal metamorphism, pyrite, epidote, recrystallization
1158 Chlorite-epidote-pyrite mineralization; trace galena, chalcopyrite
1182 Galena-pyrite-chalcopyrite stringers
1188-1191 Blebs of galena-chalcopyrite-epidote-calcite up to 1" long. Disseminated galena-sphalerite.
1193, 1195, 1197, 1200 Veins, up to 1.5", galena-pyrite-chalcopyrite-sphalerite-calcite, 15°. Disseminated galena-sphalerite
1201-1204 Broken core
1204 Chloritized graywacke; pyrite 1-2%
1212 8" quartz vein 60° 1% pyrite
1213 Graywacke, pyrite, stringers of galena
1220-1223 Quartz-pyrite vein 20°, minor galena and chalcopyrite
1218-1222 5% pyrite, 0.1% Cu, 0.1% Pb
1230 Base metal zone
1230-1235 Graywacke conglomerate, clasts of sediments and volcanics up to 2" diam. 1% pyrite
1235-1246 Graywacke, 2% pyrite, minor epidote, pyrite decreases with depth
1258 2-3% pyrite, fine-grained chlorite-epidote alteration, trace galena
1270-1281 Conglomerate; thoroughly altered, galena-calcite-sphalerite stringers
1281 3" quartz-pyrite vein 50°
1300 Base metals zone. 0.5% pyrite
1308-1316 Fracture zone, no alteration, weak Fe oxides
1325 Chloritic, argillic alteration, 2% pyrite, rock fragments up to 8"
1342 Galena-epidote-calcite stringers; alteration becoming less pervasive, more irregular
1369 No alteration
1378 1/2" galena-pyrite-chalcopyrite-sphalerite-calcite vein, 50° sulfide content increasing with depth

1398-1516 Gray arkosic sandstone conglomerate, clasts of sediments and volcanics. 0.5-1% disseminated pyrite, 1% galena and chalcopyrite. Galena-chalcopyrite-calcite stringers; chalorite-epidote, argillic alteration.

1416 Stringers of sphalerite
1428-1429 Quartz-calcite-pyrite vein
1430 Disseminated galena and chalcopyrite
1464 Sphalerite-epidote-quartz-chalcopyrite stringers
1496 Pyrite increasing to 1%

Frequency of clasts decreasing
Pyrite 0.5% decreasing

1502 1" sphalerite-pyrite-epidote-quartz vein, 25°
1510 1/4" vein same as above, 20°

1516-1537 Gradational contact to massive light gray shale. Grades into dark very-thin-bedded shale then back to massive shale. Abundant calcite stringers. Pyrite 0.5-1%. Grades into limestone below.

1537-1556 Light gray massive limestone, slightly recrystallized, 0.1-0.2% pyrite and few calcite stringers. Badly broken core near bottom.

1556-1560 Light gray fine-grained quartzite, calcareous matrix 0.1% pyrite

1560-1579 Argillaceous sandstone, with few clasts, partially epidotized, 0.5% pyrite argillic-chloritic alteration

1579-1584 Coarse grained sandstone, no pyrite, argillic-chloritic-epidote alteration

1584-1672 Fine-grained argillaceous sandstone 0.5% disseminated pyrite, light gray to white

1554-1674 Badly broken core. Local pebbles up to 1" diam. erratic pyrite distribution. Calcareous matrix below 1618
1638-1642 No core
1650 Silicified
1654-1658 Silicified sandstone or quartz vein, 10% pyrite with galena, chalcopyrite and sphalerite
1657-1663 Gouge, high pyrite
1658-1660 Lost core
1667-1672 Gouge

1672-1700 Very fine-grained gray quartzite, very thinly bedded near top becoming more massive with depth, 40° on bedding, fine pyrite, 5-7% chalcopyrite minor galena.

1676-1700 Fine-grained, silicified, pyrite 0.5% locally, massive epidote nodules with pyrite and chalcopyrite

1700-1704 Maroon, arkosic shale, trace pyrite, minor epidote

1704-1795 Fine-grained argillaceous quartzite, light gray, 0.5% disseminated pyrite

1709 No pyrite
1714 Limestone inclusions
1718 0.5% pyrite
1729 and 1737 1/2" veins of quartz-sphalerite-chalcopyrite-galena with epidote rim
1772 Pyrite gone
1772-1782 Contact; 70°, with epidotic hornfelsic shale epidote-calcite nodules, trace pyrite
1795 End of drilling as of 24 September 1970

GENERALIZED DESCRIPTIVE LOG (Cont.)

Charleston Lead Mine Cochise County James Stewart Construction Co.

HORNE (STEWART) # 5 DRILL HOLE

1795-1805	Quartzite, light gray, fine grained, trace of pyrite along fractures. 1798-1804 Fractured and bleached zone, calcite along fractures.
1805-1817	Hornfelsic shale, dark gray, epidote nodules, pyrite and calcite in nodules and in stringers, 0.1-0.3% disseminated pyrite 1814-1817 Fracture zone, clay in stringers
1817-1824	Quartzite, gray, calcite in stringers $<$0.1% pyrite
1824-1847	Hornfelsic shale, epidote in nodules, $<$ 0.1% pyrite, dark gray with several maroon horizons; pyrite and chlorite on high-angle slips.
1847-1853	Quartzite, light gray, fine-to-medium grained, 0.1% disseminated pyrite.
1853-1873	Shale, maroon, epidote nodules, bleached with pyrite and epidote, calcite and clay on slips.
1873-1919	Hornfelsic shales, gray, epidotized; epidote-calcite-chlorite nodules with pink matrix, $<$0.1% pyrite, last 20' is maroon and coarser grained. 1914-1917 Fracture zone.
1919-1927	Quartzite, light gray, very-fine-grained; some epidote on fractures.
1927-1947	Hornfelsic shale, epidotized as above.
1947-1961	Quartzite, fine grained as above.
1961-1978	Hornfelsic shales, white to gray, epidote nodules, 0.1% disseminated pyrite. 1965-1966 Broken core, no pyrite below fracture.
1978-2014	Quartzite, light gray, fine-to-medium grained. Calcite on slips, local thin beds of hornfelsic shale.
2014-2040	Hornfelsic shale, epidote nodules with calcite, 0.1-0.2% disseminated pyrite irregularly distributed, trace of sphalerite in last 2'.
2040-2048	Quartzite, light gray, locally epidotized, sphalerite in stringers and disseminated $<$ 0.1-0.2% pyrite, trace chalcopyrite, stringers of calcite.

2048-2080	Hornfelsic shale, light to dark gray, epidote in stringers and nodules, 0.1-0.2% disseminated pyrite, trace chalcopyrite, trace galena and sphalerite in blebs and disseminated, sparse mineralization below 2064. 2069-2074 chloritized, pyrite, sphalerite, chalcopyrite, galena disseminated in friable fractured rock.
2080-2083	Quartzite, chloritized, disseminated pyrite, chalcopyrite, sphalerite, galena.
2083-2105	Quartzite, trace of chlorite, trace disseminated pyrite, stringers of epidote-calcite-pyrite-chalcopyrite-sphalerite-galena.
2105-2118	Hornfelsic shale, epidotized, calcite-pyrite-epidote-sphalerite-chalcopyrite in stringers, local disseminated chalcopyrite, pyrite 0.5% decreasing with depth.
2118-2127	Quartzite, very fine-grained, gray, epidote-calcite stringers, $<$ 0.1% pyrite.
2127-2147	Hornfelsic shale, as above. 2130 3" long sphalerite-chalcopyrite bleb.
2147-2151	Quartzite as above.
2151-2213	Hornfelsic shale as above. 2161 1' fracture zone 2165 Pyrite stringers 2169 Pyrite-epidote-calcite stringers, epidote nodules 2191-2195 Fracture zone, finely broken, argillized, 0.5-0.1% pyrite disseminated and in veins.
2213-2231	Contact zone, abundant epidote-chlorite-calcite blebs and spots, 0.5-0.1% pyrite, dark gray quartzitic to volcanic rock, local phenocrysts of pink feldspar?, local intense brecciation
2231-2313	Dark to medium gray latite to andesite porphyry, phenocrysts are epidotized. 1-3% disseminated pyrite 2269-2275 Fracture zones with gouge
2313-2316	Contact zone, chloritized, bleached, broken rock fragments
2316-2318	Black, aphanitic rock with feldspar phenocrysts and epidote blebs.
2318-2322	Quartzite, gray, fine grained, relic bedding at 45°, interbedded with metashale at bottom, epidotized.
2322-2336	Hornfelsic shale as above.

2336-2374	Quartzite, light gray, fine-to-medium grained, local epidote stringers. 2352 2" dike andesite porphyry. 2369 6" of disseminated galena.
2374-2528	Alternating quartzite and hornfelsic shale, each 5 to 10' thick. Hornfelses are epidotized with minor local epidote nodules. 0.1% pyrite average distributed irregularly with no apparent control. Broken core at 2497-2499, 2501-2507, 2514-2517
2528	End of hole.

JED:a
October 19, 1970

CHARLESTON MINE

Assay Summary

HOLE #1

Depth	% Cu	oz/Ton Ag	oz/Ton Au	% Ni	% Pb	% Zn
265	.09	0.4	--	--	.16	.44
280	.05	--	--	.03	--	--
315	1.0	--	--	--	--	--
360	.03	--	--	--	.09	.21
415	.10	--	--	--	.06	.10
510	.03	--	.03	--	.16	.21
525	.25	.7	.11	--	Tr	4.90
541	.01	--	--	--	.06	.12
642	.26	--	--	--	Tr	1.2
703 - 713	.08	--	--	.01	--	--
720	.08	--	--	--	--	11.40
810	.02	--	.02	--	--	--
860 - 887	--	--	--	.15	--	--
864	.055	.4	.02	--	.02	1.0
898	.04	0.7	.03	--	--	--
1102 - 1106	.485	0.7	Tr	--	--	--
1108	.095	.04	--	--	--	--
1106 - 1108	.10	3.0	Tr	--	0.6	--
1148	.035	.04	--	--	--	--
1300	.02	.02				
1541	.07	.3				
632 1632	.01	--	--	.03	--	--
636	.08	.5	--	.03	5.6	8.05

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CHARLESTON PROPERTY

Assay Summary
Drill Hole #2

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
580	.045					0.4
598	.03					0.3
620	.04					0.4
660	.035					0.3
750	.02	Tr				1.6
781	.03		0.9		.01	0.6
1005 - 1008	.43	4.88	9.2			
1028 - 1032	.07	.6	5.0	0.0021		
1028 - 1032	.084	.65	1.22		.003	.14
1028 - 1032	.049	.66	1.03			.11
1098 - 1107	.030	Tr	.08			
1107 - 1116.6	.041	Tr	.12			
1116.6 - 1128	.029	Tr	Tr			
1128 - 1138	,030	Tr	Tr			
1138 - 1148	.042	Tr	.05			
1148 - 1158	.021	Tr	Tr			
1158 - 1167	.068	Tr	.07			
1167 - 1179	.041	Tr	.05			
1175 - 1185	.16	.44	1.48	0.0028	.02	
1175 - 1185	.113	.05	1.35			.42
1175 - 1185				0.0028	.02	
1179 - 1188	.022	Tr	.06			
1188 - 1197	.051	Tr	.05			
1323 - 1331	.01	?	1.50	0.0021	.01	
1323 - 1331	.038	.40	.56			.11
1333.5 - 1337.5	.02	?	1.10	0.0023	.01	
1333.5 - 1337.5	.080	.05	.10			.04
1377 - 1382.5	.019	.12	.25			
1382.5 - 1387.5	.030	.07	.27			
1387.5 - 1391.75	.032	.07	.15			
1391.75- 1396	.048	.24	.70			
1407 - 1411.5	.14	1.45	2.87			
1411.5 - 1416	.048	.10	Tr			
1416 - 1422.5	.029	.07	Tr			
1422.5 - 1429	.038	.10	.20			
1429 - 1434	.047	.12	.25			
1434 - 1439	.048	.02	.05			
1439 - 1444	.049	.30	.32			
1444 - 1448.5	.028	.25	.12			
1448.5 - 1453	.038	.13	.20			
1453 - 1457	.07	.66	1.40			
1457 - 1462	.16	.65	1.75			
1462 - 1467	.03	.05	.25			
1532 - 1534	.026	.21	.40			
1656.5 - 1661	.038	Tr	Tr			
1661 - 1665	.029	Tr	Tr			
1665 - 1670	.038	Tr	Tr			
1670 - 1675	.029	Tr	Tr			
1678 - 1680	.030	Tr	Tr			
1680 - 1685.5	.019	Tr	Tr			
1690.5 - 1694.5	.028	.05	.12			

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Footare	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
1694 - 1699	.028	.05	.10			
1699 - 1703	.029	.05	.12			
1703 - 1708	.027	.03	.12			
1708 - 1713	.049	.06	Tr			
1721.5 - 1726.5	.038	.36	.60 ✓			1.49 ✓
1726.5 - 1732	.101	.44	.64			1.49 ✓
1726.5 - 1732				0.0024	.02	
1726 - 1732	.10	.42	3.70 ✓	0.0024	.02	0.7
1732 -1737	.047	.46	3.40 ✓			
1737 - 1741	.076	.03	.17			
1741 - 1745.5	.028	.12	.25			
1745.5 - 1750	.020	.07	.30			
1750.5 - 1755	.037	.07	.25			
1755 - 1759.5	.028	Tr	.05			
1759.5 - 1763.5	.047	Tr	.05			
1763.5 - 1767.5	.036	.05	.12			
1767.5 - 1772.5	.029	.03	.12			
1772.5 - 1776.5	.029	.03	Tr			
1776.5 - 1780	.037	.02	Tr			
1780.5 - 1785	.029	.03	Tr			
1785 - 1789.5	.048	.05	Tr			
1789.5 - 1793.5	.029	.02	Tr			
1793.5 - 1798.5	.048	.03	.05			
1798.5 - 1803	.037	.03	.07			
1803 -1808	.029	.03	.07			
1808 -1812	.037	.14	.50 ✓			
1812 - 1816	.076	.12	.40			
1816 - 1821.5	.048	Tr	Tr			
1820.5 -	1.9 ✓	.35	6.1 ✓		.02	
1821.5 - 1826.5	.029	Tr	Tr			
1826.5 - 1831	.029	Tr	Tr			
1831 - 1836	.037	Tr	Tr			
1836 - 1841	.029	Tr	Tr			
1841 - 1845	.037	Tr	Tr			
1845.5 - 1850.5	.029.	.05	.02			
1850.5 - 1854.5	.21	.92 ✓	1.12 ✓	0.0025		
1850					.01	0.2
1850.5 - 1854	.239	.78	1.64			.27
1854.5 - 1858.5	.087	.10	.12			
1886 - 1889.5	.029	.02	Tr			
1893 - 1896.5	.057	Tr	Tr			
1896.5 - 1901	.029	Tr	Tr			
1901 - 1905	.037	.08	Tr			
1905 - 1910	.029	Tr	Tr			
1910 - 1915.5	.038	.02	Tr			
1915.5 - 1919	.019	Tr	Tr			
1923	.05		14.7 ✓			
1858.5 - 1862	.048	.34	.7 ✓			
1862 - 1867	.04	Tr	Tr			
1867.5 - 1872	.052	Tr	Tr			
1872 - 1876	.028	Tr	Tr			
1876.5 - 1881	.042	Tr	.05			
1881 - 1886	.028	.03	.03			
- 1923.5	.041	1.80 ✓	2.20			
1923.5 - 1928	.028	Tr	Tr			
1928 - 1931.5	.037	Tr	.07			

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton AG
1931.5 - 1935	.039	Tr	.05			
1935 - 1937.5	.038	Tr	.06			
1937.5 - 1941	.030	Tr	.05			
1941 - 1946.5	.049	Tr	.03			
1946.5 - 1951	.032	Tr	Tr			
1951 - 1956	.049	Tr	Tr			
1956 - 1961	.031	Tr	Tr			
1961 - 1965.5	.042	Tr	.07			
1965.5 - 1969	.04	Tr	Tr			
1969 - 1974	.029	Tr	.05			
1974 - 1978	.041	Tr	Tr			
1978 - 1983.6	.03	Tr	.04			
1983.6 - 1988	.028	Tr	Tr			
1988 - 1993	.032	Tr	Tr			
1993 - 1998	.052	Tr	Tr			
1998 - 2002	.03	Tr	Tr			
2002 - 2007	.028	Tr	.02			
2007 - 2011	.032	Tr	.07			
2011 - 2015	.04	Tr	.04			
2015 -2021	.042	Tr	.12			
2021 - 2024	.032	Tr	Tr			
2024 - 2027	.021	Tr	Tr			
2027 - 2031.5	.029	Tr	Tr			
2031.5 - 2036	.030	Tr	Tr			
2036 - 2040.5	.042	Tr	Tr			
2040 - 2045	.061	Tr	Tr			
2045 - 2050	.04	Tr	Tr			
2050 -2054	.049	Tr	Tr			
2054 - 2058	.027	Tr	Tr			
2058 -2063	.041	Tr	Tr			
2063 -2068	.039	Tr				
2068 - 2073	.03	Tr				
2073 - 2078	.032	Tr	.05			
2078 - 2082	.040	Tr	.03			
2082 - 2087	.059	Tr	.05			
2087 - 2092	.05	Tr	.05			
2093 - 2097	.042	Tr	.045			
2097 - 2103	.06	Tr	Tr			
2103 - 2107	.072	Tr	Tr			
2107 - 2113	.039	Tr	Tr			
2113 - 2116	.04	Tr	Tr			
2116 - 2121	.062	Tr	Tr			
2121 - 2125	.03	Tr	.12			
2125 - 2130	.042	Tr	Tr			
2130 - 2135	.049	Tr	Tr			
2135 - 2139	.041	Tr	.07			
2139 - 2144	.03		.07			
2144 - 2149	.039		Tr			
2149 - 2154	.038		.05			
2154 - 2157	.04		.03			
2157 - 2162	.031		.05			
2162 - 2167	.052		.04			
2167.5 - 2172.	.03	Tr	.07			
2172 - 2176.5	.06	Tr	.10			
2176.5 - 2181	.06	Tr	1.0			
2181.5 - 2185.7	.05	Tr	.9			
2185.7 - 2189.7	.07	Tr	.4			

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
2189.7 - 2195	.03	.15	.15			
2195 - 2200	.03	.12	.12			
2200 - 2205	.04	.05	.07			
2205 - 2209.5	.03	.12	.12			
2209.5 - 2214	.06	Tr	.25			
2214 - 2219	.07	Tr	.25			
2219 - 2223	.06	.14	.22			
2223 - 2229.5	.11	Tr	Tr			
2229.5 - 2236	.10	Tr	Tr			
2236 - 2241	.05	Tr	Tr			
2241 - 2245.5	.04	Tr	.05			
2246.5 - 2251.5	.05	Tr	.05			
2251.5 - 2256.5	.05	Tr	Tr			
2256.5 - 2261.5	.16	Tr	Tr			
2261.5 - 2266.5	3.40	Tr	.07			.86
2261 - 2266	3.36	.05	.10			.86
2266.5 - 2272	3.56	Tr	.05	0.0066	.02	.97
2266 - 2272	3.38	.05	.08		.002	.82
2266 - 2272	2.56	.05	.09			.97
2266.5 - 2272				0.0066	.02	.70
2272 - 2278	.28	Tr	Tr			
2278 - 2283	.05	Tr	Tr			
2283 - 2288	.05	Tr	1.25			
2288 - 2291.5	.037	Tr	.12			
2291.5 - 2293.7	.049	Tr	.05			
2293.7 - 2301	.041	Tr	Tr			
2306 - 2309	.021	Tr	.03			
2309.5 - 2314.5	.019	Tr	.05			
2314.5 - 2318.5	.020	Tr	Tr			
2318.5 - 2323.5	.022	Tr	Tr			
2323.5 - 2328	.039	Tr	.40			
2328 - 2332.5	.018	Tr	.07			
2332.5 -2337	.04	Tr	Tr			
2337 - 2342	.06	Tr	.07			
2342 - 2347	.04	Tr	Tr			
2347 - 2351.5	.027	Tr	Tr			
2351 - 2356.5	.031	Tr	Tr			
2356.5 - 2361.5	.029	Tr	Tr			
2361.5 - 2366	.027	Tr	Tr			
2366 -2371	.042	Tr	.03			
2371 - 2375	.031	Tr	.05			
2375 - 2380	.032	Tr	.07			
2380 - 2384	.029	Tr	Tr			
2384 - 2388	.030	Tr	Tr			
2388 - 2393	.042	Tr	Tr			
2393 - 2397.5	.029	Tr	Tr			
2397.5 - 2402	.07	Tr	Tr			
2402 - 2407	.07	Tr	.03			
2407 - 2412	.049	Tr	.02			
2412 - 2417	.03	Tr	.02			
2417 - 2421	.041	Tr	Tr			
2421 - 242625	.032	Tr	Tr			
2426.5 - 2430.5	.029	Tr	Tr			
2430.5 - 2435.7	.019	Tr	Tr			
2435.7 - 2440	.042	Tr	Tr			
2440 - 2445.9	.027	Tr	.07			
2445.9 - 2450	.038	Tr	.05			

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
2450 - 2456	.04	Tr	.04			
2456 - 2461	.042	Tr	Tr			
2461 - 2464	.027	Tr	.06			
2464 - 2470	.019	Tr	Tr			
2470 - 2474	.041	Tr	.05			
2474 - 2479	.02	Tr	Tr			
2479 - 2483	.032	Tr	Tr			
2483 - 2488	.029	Tr	.07			
2488 - 2492	.031	Tr	Tr			
2492 - 2497	.019	Tr	Tr			
2497 - 2502	.029	Tr	Tr			
2512 - 2515	.020	Tr	.03	0.0027		
2512 - 2516	.028					
2515 - 2526	.10	Tr	2.40			
2516 - 2520	.056			0.0029		
2516 - 2520	.053	.05	.05			.02
2578.25 - 2583	.09	Tr	.30			
2583 - 2588	.028	Tr	.07			
2588 - 2593	.042	Tr	1.20 ✓			
2593 - 2598	.031	Tr	.12			
2598 - 2603	.029	Tr	Tr			
2603 - 2607	.037	Tr	.07			
2607 - 2610	.04	Tr	.05			
2610 - 2615	.028	Tr	Tr			
2615 - 2620	.031	Tr	.08			
2620 - 2624	.088	Tr	.03			
2624 - 2628.5	.12	Tr	1.12 ✓			
2628.5 - 2633.5	.010					
2633.5 - 2639.5	.010					
2639.5 - 2644	.028			0.0021		
2644 - 2648.6	.048					
2648.6 - 2652	.010					
2652 - 2657.4	.026					
2657.4 - 2662	.036					
2662 - 2666.7	.026					
2666.7 - 2672	.018					
2672 - 2677	.018					
2677 - 2682	.027					
2682 - 2687	.018					
2687 - 2692	.016					
2692 - 2695.5	.016					
2695.5 - 2701	.010					
2701 - 2705	.028					
2705 - 2709	.016					
2709 - 2714	.010					
2714 - 2719	.028					
2719 - 2724.5	.010					
2724.5 - 2728	.029					
2728 - 2733	.016					
2733 - 2737.5	.018					
2845	.016					
2850	.027					
2854	.028					
2857 - 2862	.020					
2866 - 2871	.020					

Footage	% Cu	% Pb	% Zn	% MoS_2	oz/ton Au	oz/ton Ag
2930 - 3935.5	.015					
2945 - 2947	.048					
2945 - 2947	.057	.05	.05			
2947 - 2949	1.03	.05	.05		.002	.15
2947 - 2949	1.11 ✓	.05	.05			.19
2947 - 2949	.83		.70 ✓	0.0027	.02	
2949 - 2951	.076			0.0022		
2951 - 2953	.67 ✓					
2953 - 2955	.36			0.0018		
2953 - 2955	3.40 ✓	.05	.22			.08
2955 - 2957	.048			0.0021		
2957 - 2959	5.52 ✓					
2959 - 2961	5.66 ✓				.002	1.09 ✓
2959 - 2961	4.57	.05	.05			1.09
2959 - 2961	6.76		.90	0.0020	.03	
2961 - 2963	.067					
2963 - 2964.5	.028					
2963 - 2964.5	.048	.05	.05			.46
2964.5 - 2966.5	.036					
2966.5 - 2968.5	.048					
2968.5 - 2969.5	.027					
2969.5 - 2971.5	.088					
2971.5 - 2973.5	.19					
2973.5 - 2975.5	.076					
2975.5 - 2977.5	.14					
2977.5 - 2979.5	.11					
3129.5 - 3134.5	.029					
3134 - 3138.5	.029					
3175 - 3178	.018					
3178 - 3181	.036					
3181 - 3183	.048					
3183 - 3185	.078					
3185 - 3187	.057					
3187 - 3189	.220					
3189 - 3190	.150					
3190 - 3195	.048					
3195 - 3199.5	.027					
1180 - 1184.5	.08	.73	2.03		.002	.30
1186 - 1191	.05	.50	.92		.003	.22
1197 - 1200	.05	1.15	1.85		.002	.40

CHARLESTON MINING PROPERTY
Assay Summary
Drill Hole #4

Footage	Percentage							oz/ton				ppm		
	Cu	Pb	Zn	Ni	Co	S	MoS_2	Pd	Pt	Ag	Au	Mo	Co	Ni
1180 -1184	.005	.005	.010											
1478 -1479.5	.350	1.160	9.200							.20	.001	4		
1478 -1480	.410	1.05	8.90	.010	.006					.90	.001	2		
1479.5-1481	.012	.1	.12	.012	.005					.78				
1479 -1501	.02	.71	1.48			2.62		.0013	.0014	.04				
1479.5-1481	.008	.022	.100							.58	.0010			
1481 -1486	.069	.1	1.31	.009	.008					.15	.001	2		
1481 -1486	.049	.031	1.600							.08				
1485 -1487	.080	1.32	2.50	.008	.008					.15	.001	25		
1486 -1487	.056	1.345	2.800							.13				
1487 -1494	.009	.1	.39	.010	.008					.30	.001	1		
1487 -1494	.006	.060	.310							.02				
1494 -1496	.136	1.05	1.18	.012	.010					.10	.001	3		
1494 -1496	.140	1.090	1.600							.27				
1496 -1498	.024	.10	.10	.011	.033					.15	.001	10		
1496 -1498	.015	.051	.086							.02				
1498 -1501	.247	1.37	2.85	.011	.006					.10	.001	5		
1498 -1501	.220	1.275	2.400							.38				
1590 -1591	.029	.142	.440							.40	.001	10		
1611 -1616	.160	.222	.83							.20	.001	6		
1611 -1616	.14	.19	.83			1.39		.0014	.0016	.20	.001	2		
1729	.01	.10	.095			1.19		.0021	.0023	.09	.001			
1762 -1773	.290	.013	.074							.09	.001			
1762 -1830	1.53	.17	.13			2.26		.0025	.0026	.15	.001	3		
1791 -1796	7.70	.58	.81			8.88		.0018	.0018	1.46	.0038			
1791.5-1802	.029	.049	.073							5.84	.0018			
1791.5-1802	5.40	.24	.58	.010	.004					.80	.001	45		
1791.5-1802	4.950	.234	.450							5.25	.002			
1802 -1810	.048	.1	.05	.009	.002					.50	.001	50		
1802 -1810	.052	.008	.028							.11				
1810 -1817.5	1.59	.1	.10	.009	.005					.10	.001	20		
1810 -1817.5	1.800	.029	.100							.74				
1817.5-1822	1.400	.016	.048							.75	.001	75		
1817.5-1822	1.16	.1	.05	.011	.006					.45	.001	30		
1852.5-1853.5	.020	.440	.480							.27				
1890	.02	.32	1.93			1.22		.0018	.0018	.20	.001	5		
1895 -1898	.28	.25	5.3							.88	.001			
										1.3	.001	2		

Footage	Percentage							oz/ton				ppm		
	Cu	Pb	Zn	Ni	Co	S	MoS_2	Pd	Pt	Ag	Au	Mo	Co	Ni
1895.5-1898.5	2.98	.26	6.40	.009	.010		.05			1.39				
1898 -1902	.18	.48	2.7							1.5	.001	2		
1896 -1903	.53	.46	13.9			7.73		.0016	.0016	2.04	.001			
1898.5-1902	.245	.37	2.00	.009	.006					1.26				
1902 -1903	.54	.40	10.0							2.2	.001	1		
1902 -1903	.365	.37	10.00	.008	.011		.05			2.16				
2023 -2025	.11	.005	.08							.1	.001	2		
2097 -2099	.78	.15	15.1							2.0	.003	1		
2097 -2099	1.15	.26	13.4			8.23		.0018	.0023	2.34	.0015			
2097.5-2099	.690	.13	17.0	.009	.018					2.02				
2099 -2101	.08	.02	2.9							.4	.002	1		
2101 -2104	.46	.03	4.0							.5	.002	1		
2099 -2104	.21	.04	1.41			.88		.0021	.0030	.088	.001			
2183 -2190	.49	.06	12.0			6.66		.0016	.0018	.58	.001			
2183.5-2190	.67	.03	8.2							.8	.002	1		
2230 -2232	.68	.03	2.4							.4	.001	3		
2230.5-2231.5	.700	.02	1.90	.009	.005					.42				
2231 -2236	.44	.10	3.5							.8	.001	3		
2231.5-2236	.44	.10	2.80	.009	.005					.67				
2249 -2249.5	1.30	.14	1.1							.7	.002	10		
2276 -2278	.004	.018	.02							.13	.002	4	90	70
2424	.01	.03	.007			3.15		.0069	.0076	.09	.0016			
2438 -2439 10"	.009	.035	17.00							.43	.002	2	50	190
2597 -2604	.365	.030	1.10							.65	.002	1	40	15
2699.5-2705.5	.080	.010	.03							.26	.002	13	40	10
1987 -1995	.05	.46	1.20							.21	.002			

#4

CARLOS ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. 7126

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE (AC 602) 364-8092
DOUGLAS, ARIZONA - 85607

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

ASSAYERS & METALLURGICAL CHEMISTS

CERTIFICATE OF ASSAY

LOCATION:
CHARLESTON LEAD MINE
TOMBSTONE QUAD., ARIZONA

Name Western Exploration, Drawer 1217, Douglas, Arizona D.D.H. STEWART NO.5

Attn: Mr. J. Forrester

		GOLD OZS	SILVER OZS	COPPER %	Pb %	Zn %	INTERVALS	BOX NO.
30800	14462	Tr	Tr	0.058	0.25	0.79	1185 - 1189	129
30801	14463	Tr	Tr	0.058	0.31	0.96	1189 - 1191	"
30802	14464	Tr	Tr	0.068	0.32	0.78	1191 - 1193	"
30803	14465	0.08	0.78	0.116	0.34	1.68	1193 - 1195	"
30804	14466	Tr	0.18	0.280	2.88	4.27	1195 - 1197	"
30805	14467	Tr	0.08	0.165	0.64	2.29	1197 - 1198	"
30806	14468	Tr	0.02	0.145	0.22	1.69	1198 - 1200	130
30807	14469	Tr	Tr	0.129	0.27	1.29	1200 - 1202	"
30808	14470	Tr	Tr	0.068	0.37	1.28	1202 - 1204	"
30809	14471	Tr	Tr	0.087	0.25	1.09	1204 - 1206	"
30810	14472	Tr	Tr	0.097	0.25	1.00	1206 - 1208	"
30811	14473	Tr	Tr	0.107	0.32	1.08	1208 - 1210	131
30812	14474	Tr	Tr	0.078	Tr	1.18	1210 - 1212	"
30813	14475	Tr	Tr	0.078	Tr	0.98	1218 - 1220	132
30814	14476	Tr	Tr	0.089	Tr	1.28	1220 - 1222	"
30815	14477	Tr	0.02	0.097	Tr	1.86	1222 - 1224	"
30816	14478	Tr	0.02	0.078	Tr	1.97	1224 - 1226	"
30817	14479	Tr	0.18	0.107	Tr	1.19	1226 - 1228	"
30818	14480	Tr	Tr	0.087	Tr	1.27	1228 - 1233	133
30819	14481	Tr	Tr	0.068	Tr	Tr	1233 - 1237	"
30820	14482	0.02	12.32	0.087	Tr	Tr	1237 - 1242	134
30821	14483	Tr	Tr	0.079	Tr	Tr	1242 - 1246	"
30822	14484	Tr	Tr	0.068	Tr	Tr	1281 - 1282	138

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

REMARKS:

DATE: November 19, 1970

CHARGES: $ 264.50

CARLOS ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. 7126

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE (AC 602) 364-8092
DOUGLAS, ARIZONA - 85607

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

ASSAYERS & METALLURGICAL CHEMISTS

CERTIFICATE OF ASSAY

LOCATION:
CHARLESTON MINE
TOMBSTONE QUAD., ARIZONA
D.D.H. STEWART No. 5

Name Western Exploration, Drawer 1217, Douglas, Arizona

		GOLD OZS	SILVER OZS	COPPER %	Pb %	Zn %		INTERVALS		BOX No.
30823	14485	Tr	Tr	0.068	tr	tr	CORE	1323	1325	143
30824	14486	Tr	Tr	0.058	0.10	tr		1325	1327	"
30825	14487	Tr	Tr	0.068	0.18	tr		1327	1329	"
30826	14488	0.01	1.93	0.058	0.21	0.80		1329	1331	"
30827	14489	Tr	0.04	0.068	0.15	tr		1331	1332	"
30828	14490	Tr	Tr	0.087	tr	0.50		1389	1394	150
30829	14491	Tr	0.08	0.079	tr	1.50		1394	1398	"
30830	14492	Tr	Tr	0.068	tr	tr		1398	1403	151
30831	14493	Tr	Tr	0.087	tr	tr		1403	1408	"
30832	14494	Tr	Tr	0.078	tr	tr		1408	1413	152
30833	14495	Tr	Tr	0.079	tr	tr		1413	1417	"
30834	14496	Tr	Tr	0.058	tr	tr		1417	1422	153
30835	14497	Tr	Tr	0.068	tr	tr		1422	1427	"
30836	14498	Tr	Tr	0.068	tr	tr		1427	1432	154
30837	14499	Tr	Tr	0.097	tr	tr		1432	1436	"
30838	14500	Tr	Tr	0.079	tr	tr		1436	1441	155
30839	14316	Tr	Tr	0.050	tr	tr		1441	1446	"
30840	14317	Tr	Tr	0.050	tr	tr		1512	1517	163
30841	14318	Tr	Tr	0.050	tr	tr		1517	1521	"
30842	14319	Tr	Tr	0.040	tr	tr		[illegible]	1605	173
30843	14320	Tr	Tr	0.040	tr	tr		1605	1609	"
30844	14321	Tr	Tr	0.069	tr	tr		1609	1624	175
30845	14322	Tr	Tr	0.050	tr	tr		1624	1629	"

REGISTERED ASSAYER CERTIFICATE 7126 CARLOS ROCHIN Signed Arizona U.S.A.

REMARKS:

DATE: 22 Nov 70

CHARGES: $ 284.50

CARLOS ROCHIN
MANAGER
REGISTERED ASSAYER
ARIZONA REG. 7126

ROCHIN ENGINEERING AND ASSAY OFFICE

P. O. BOX 218 PHONE (AC 602) 364-8092
DOUGLAS, ARIZONA - 85607

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

ASSAYERS & METALLURGICAL CHEMISTS

CERTIFICATE OF ASSAY

LOCATION:
CHARLESTON LEAD MINE
TOMBSTONE QUAD., ARIZONA
D.D.H. STEWART No.5

Name Western Exploration, Drawer 1217, Douglas, Arizona

Attn: Mr. J. Forrester		GOLD OZS	SILVER OZS	COPPER %	Pb %	Zn %		INTERVALS	BOX No.
30846	14323	Tr	Tr	0.050	tr	tr	CORE	1643 - 1645	177
30847	14324	Tr	Tr	0.030	tr	tr		1645 - 1647	"
30848	14325	Tr	Tr	0.020	tr	tr		1647 - 1649	"
30849	14326	Tr	Tr	0.040	tr	tr		1649 - 1651	"
30850	14327	Tr	Tr	0.050	tr	tr		1651 - 1653	"
30851	14328	Tr	Tr	0.040	tr	tr		1653 - 1655	178
30852	14329	Tr	Tr	0.327	1.60	2.50		1655 - 1657	"
30853	14330	Tr	Tr	0.268	0.27	0.50		1657 - 1659	"
30854	14331	Tr	Tr	0.060	tr	tr		1659 - 1662	"
30855	14332	Tr	Tr	0.040	tr	tr		1662 - 1665	"
30856	14333	Tr	0.10	0.754	tr	tr		1665 - 1667	179
30857	14334	Tr	0.04	0.536	tr	tr		1667 - 1669	"
30858	14335	Tr	Tr	0.119	tr	tr		1669 - 1672	"
30859	14336	Tr	0.34	1.310	tr	tr		1672 - 1674	"
30860	14342	Tr	Tr	0.069	tr	tr		1674 - 1676	"

REGISTERED ASSAYER
CERTIFICATE NO. 7126
CARLOS ROCHIN
Date Signed
Arizona U. S. A.

REMARKS:

DATE: 22 Nov 70

CHARGES: $ 172.50

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GEOLOGIC LOG

Final depth 700
Elevation
Coordinates
Inclination Vertical

Project Charleston

Chs-1

HOLE NO. Chs 1
Sheet No. 1
Date Completed
Logged by A R King

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	22																		PLUG BIT
22	181	159	NC		+85	6-8	3/1		+				✓	+				U.S. por	oxidized to 150' alter is intense, breccia cavities occas. pr small fault 181-18[illegible]
181	228	47	NC		"	5-7	3/1		+				✓	+				An por	PROB dike
228	278	50	NC		"	4-3	3/1		+				✓	+				Δ	Heterolithic breccia
278	356	78	NC		"	7	3/1		+				+	✓				(An por) Δ	with open cavities as above. less per cavities small fau 236 & 284.
356	450	94	NC		"	6-8	3/1		+				+	✓				Δ	good breccia w/ fl NATURE as w/ min
450	505	55	NC		"	3-5	4/1	100/1	+	tr			+			tr		An por	mix Gd por. alter becoming more chl, mag as diss & uns poss fault 470-490
505	690	185	NC		"	5-7	3/1	100/1	+	tr			+					Δ	beautiful heterolit breccia as seen in outcrop
690	811	121	NC		"	4-6	2/1		+				+					An por	breccia in part. alter decreasing in $CaCO_3$ occurring along fract.
811	831	20	NC		"	6	4/1		+				+					Gd por	less gmss, lighter color, alter remain same intensity
831	916	85	NC		"	4-5	2/1	20/1	+	tr			+			✓		And por	somewhat fluidiz & brecciated, cpy both diss & fract
916	950	34	NC		"	3-4	1/1	15/1	+	✓	?		+			tr		Gd por	well mineral but alter decreasing silic in [illegible] ?

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GEOLOGIC LOG

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HOLE No. [redacted] Chs-1
Sheet No. 2
Date Completed
Logged by J. R. King

Project Charleston

Chs-1

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
50	860	10	NC		-25	4	1/2		+				+			tr		Δ	intrusive breccia mod to strong alter
0	1000	40	NC		+85	5	2/1		+				+			tr		Gd por	as before, small faults 967, 998.
00	1021	21	NX		+85	5	2/1		+				+			tr		"	as above
21	1411	390	NX		+85	3	1/2	20/1	+	tr			✓			✓	✓	An por	alter - weak to v. chl increasing
11	1658	247	NX		+85	2-4	1/3	15/1	+	✓			+		tr	✓	✓	Δ	intrusive heterolith breccia. no open cavities 1507-17, 1610-12
58	1829	171	NX		+85	2	1/1	15/1	+	tr			+			✓	✓	Gd por	as before shows several zones of brecciation good gouge 1792-1800, 182
29	2151	322	NX		+85	3	1/2	20/1	+	tr			+			tr	✓	Gd por	as before alter mod to strong
51	2312	161	NX		+85	4	1/2	25/1	+	tr			+				+	Δ-Gd por	variable por & breccia, alter stro
312	2392	80	NX		+85	5	1/1	30/1	+	tr		? Gn	+				+	Gd por	small fault-2307 alter strong
2	2617	225	NX		+85	4	1/2	15/1	+	✓			+			✓	✓	Δ-Gd por	as above alter mod-strong heterolith breccia in part, some stockwork VNING.
7	2879	262	NX		+85	3	1/3	10/1	+	✓			+		tr	tr	tr	Δ	Heterolith breccia & gd por - mix - an po alter mod to strong
79	2947	68	NX		+85	2	1/4	20/1			?		+		tr	✓	tr	Gd por	as before alter wk to mod.
			END OF NX																

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GEOLOGIC LOG

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HOLE [redacted] C[redacted]1

Sheet No. 3

Date Completed

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Project Charleston

Chs-1

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
47	3005	58	Bx		+85	2	1/4	20/1	+	✓	?		+		?	+r		Gd por	as before [illegible] -2967, alteration weak to moderate
205	3038	33	Bx		+70°	2	?											cataclastic - broken - faulte	
038	3469	431	Bx		+85°	1-2	1/4	10/1	+	✓			+		+r	✓		Gd por -	mix An por, alter weak to moderate cpy more abundan
69	3605	136	Bx		+85	2	1/3	8/1	+	✓	?		+		✓	+r		Gd por -	mix An por as above. some zones of better cpy
05	3656	51	Bx		+65	2	1/2	20/1	+	+r								fault	zone
656	3749	93	Bx		+85	1-2	1/1	30/1	+	+r			+		✓	+r		Gd por	with some zones o An por (3600-14). alteration weak
749	3890	141	Bx		+85	1	1/2	15/1	+	✓	?		+		✓	+r		Gd por	as above, smal fault 3892 alte weak
890	4002 TD	52	Bx		+85	2	1/2	10/1	+	✓	?		+		✓	✓		Gd por.	mix an por as before alteratn weak small fau 3913, 3922.

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GEOLOGIC LOG

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HOLE [redacted] NO. [redacted] Chs-2
Sheet No. 1
Date Completed
Logged by J R Kum · S R

Project Charleston Chs-2

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization: Ratio	Py	Cpy	Mo	Others	Alteration: Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	21																		PLUG BIT
21	182		NC		+85	?	? 1/3	-					✓	+				Lus por	oxidized, with dike of And por 80-1[illegible] 132-159, alter is [illegible] mod in Lus por, w[illegible] in And por num[illegible] small faults 30, 80-89 103, 132-133, CO_3 [illegible]
182	619?		NC		+85	1-3	20/1		+				✓	+				Lus por "Uncle Sam"	as above, alter[illegible] variable wk-mod, An por dikes 182 274-281, 429-46[illegible] pebble dikes freq. as[illegible] w/ above. Fault 166, 195-208, 219-221, 267-274, 289, 310 376-403, 447, 460
619	1226		NC		+85	1-3	20/1		+			tr GN Sph	+	+				Kbv	Bronco volcanics contact approx, alte[illegible] moderate. min s[illegible] weaker. An por 768-808, 919-923, 942-[illegible] 1166, breccia 11[illegible] 1226 - strong alter[illegible]
			↓ 1012 Nx																
1226	1327		Nx		+90	1	20/1		+	tr		tr GN Sph	✓	+				An por	dike - variable ab[illegible] w/ some epidote
1327	1355		Nx		+90	1-2	10/1		+				✓	+				Bisbee	sediments, silts-s[illegible] Bedding 10°, alter[illegible] weak to mod.
1355	1407		Nx		+95	1	20/1		+					✓				An por	as above, epidot[illegible] common min [illegible] weak

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GEOLOGIC LOG

HOLE No. Ch 2

Sheet No. 2

Date Completed

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Project Charleston Chs-2

n	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
97	1853		NX		+95	≥1	20/1		+				tr	✓				Bisbee	mudstones a weak to mod; fau 1560-1579 1588 16 pebble dike 1709 bedding 7°
53	1874		NX		+95	1	20/1		+					+				An por	
74	2210		NX		+95	≥1	25/1		+	?		tr Gn ?		✓			✓	Bisbee	sediment - asab alter weak pass flourite fault 218 92, bedding 10°
10	2268		NX		95	1-2	20/1		+					+			+	An por	breccia - pebble dike in part, Bisb frags in A. ston anhydrite VNING
68	2307		NX		95	≥1	10/1		+					+				Bisbee	as above, nodula mudstones, siltstone sandstone bedding 12° dip
07	2352		NX		95	2-4	10/1		+				+	+				Peb dike	- fault zone
52	2949		NX		95	1-4	10/1		+	tr		tr Gn	✓	+				Bisbee	as above alter weak - mod bedd 15°, numerous An & biotite dikes 2470- 2503-40 2572-76 2592-2625, 2671-2 2878-2903 epi
49	3033		3002 BX		25	3-6	10/1						+	✓		tr	✓	An por-	Gd por alter mod bounded by a fau
33	3093		Bx		65													FAULT	involves both sedimen & intrusive rocks

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GEOLOGIC LOG

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HOLE No. Chs-2
Sheet No. 3
Date Completed
Project Charleston Chs-2
Logged by JRK

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
093	3245		BX		+90	1-4	15/1		+	tr		+tr GN/tr	✓	✓		+tr	✓	BISBEE	limey siltstones alter mod bedd 5° dike at 311 3149
245	3260		BX		+90	2-4	5/1	50/1	+	tr			+		+tr		+tr	An por	as before alter strong
3260	3415		BX		+90	1-4	5/1		+	tr		+tr GN SPU	✓	+			+tr	BISBEE	siltst, limey silt limest. minor cg: alter is mod, epi common silicificat
							lost hole due to water at 3030ft;											wedge set for Chs-2 at 2495	

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GEOLOGIC LOG

Depth 5028
Elevation
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Orientation Vertical ?

Project Charlestown

HOLE No. Chs-2W
Sheet No. 1
Date Completed
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Chs-2

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization: Ratio	Py	Cpy	Mo	Others	Alteration: Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
Wedge			NX																
195	3415		3202 BX ↓		90														as described on page three
15	3895		BX		90	1-2	1/3		+	tr		tr GN	+	✓			✓	BISBEE	siltst limesilt, sand epidote garn alter med to strong
895	4075		Bx		90	1-2	1/2		+				+		tr			An por	Gd por silicification note
075	4493		Bx		+90	1	1/1		+	tr		tr GN	+		?		+	BISBEE	siltst alter strong silicification bedding 10°
493	4828		Bx		+90	≥1	2/1		+	tr		tr GN	✓	✓				BISBEE	limest, congl alter wk to mod silicifica variable bedding 10°
828	4959		Bx		+85	≥1	2/1		+			tr GN						Paleozoic	marble alter is weak bedding 5°
959	4980		4985 AX ↓		+90	2-4	3/1		+				+					An por	fine grained mod alteration poor core recovery silicific noted
980	5028		AX		+80	.5-2	3/1		+	tr		tr GN						Paleozoic	marble as before contact poor core recovery alteration wk, bedding 5° small fault 5027-2

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Sheet No. 1
Date Completed
Logged by John R. [redacted]

Project Charleston

Chs-3

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	23																		Plug B,F
23	115	92	NC		+80	?1-4	–	–	+				+	+				Δ	Breccia w/ open cavi oxidation to ≈ 150' pred por + US pyr
115	210	95	NC		+80	1-3	3/1		+					+				Dacpor	dac→gd; phenos of plag, Hb, Qtz. Mcn. f alter
210	560	350	NC		+75	3-6	5/1		+				+	✓				Gdpor Δ	bottom 10' breccia in part, py filling some alteration - strong faulting - 225, 255, 3 335, 355, 458, 470,
560	610	50	NC 631		+85	3-6	4/1		+									Gdpor	as before relation
610	1070	460	NX		+85	2-5	3/1	100/1	+	tr		tr BN	+			tr	tr	Δ	heterolithic igneous breccia frag. alter - stron minor open cavit.
1070	1093	23	NX		+85	2-3	5/1		+				+					Dacpor	Δ as above except no py phenos plag hb qtz.
1093	1104	11	NX		+85	2-3	2/1		+				+					Δ	heterolithic breccia above alter is decreasing
1104	1266	162	NX		+90	2-3	10/1		+			tr BN SPH	+				✓	Qtz Mz Por	with strong py dissem. plag fault at 1260 otherwise sulfide VNING IS NORMALLY NONEXIST

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Project Charleston Chs-3

orn	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
266	1484	[illegible]	NX		[illegible]	2	3/1	25/1	+	tr			+		tr	tr	✓	Gd-Por	with dissem py [illegible] also plag [illegible] faulting 1278, 1302 some brecciation [illegible] 1453-1484
484	1516	[illegible]	NX		.90	2	3/1	20/1	+	✓		to GN	+			tr	✓	Δ	Heterolithic [illegible] breccia with [illegible]
516	1587	[illegible]	NX		.95	1	4/1	20/1	+	✓			✓			tr	✓	An por	alter definitely decreasing [illegible] of An por of Chs-
587	1930	[illegible]	NX		.95	1-2	4/1	20/1	+	✓			✓			✓	✓	Gd-por	with [illegible] K span [illegible], alter wk to strong [illegible] ser twinning [illegible] An por mix 1830-1930
930	2103	[illegible]	NX		.95	1	8/1	15/1	+	✓			✓		tr	✓	✓	Gd-por	[illegible] relatively unjointed K-phen [illegible]
103	2340	[illegible]	NX		.95	≤1	4/1	10/1	+	✓			✓		✓	✓	✓	Gd por	mix and por quite possibly an intrusive breccia zone.
340	2501	[illegible]	NX		.95	1	2/1	15/1	+	✓			✓		✓	✓	tr	Gd por-	mix and por both rocks with K-spa phenos; in part rock shows definit intrusive brecciation qtz veining & [illegible] veining prevalent

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Date Completed
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Project Charleston Chs-3

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
501	2910	[illegible]	NX		~95	2	3/1	10/1	+	✓			+		✓	✓	✓	HYBRID	[illegible] alte mod to strong. [illegible] weak [illegible] por in places not seen in Chs holes before breccia in places fau[illegible] 3054
2910	3003	93 TD	NX		~95	≤1	2/1	10/1	+	✓			tr		tr	tr	tr	Gd por	very fresh, wit[illegible] Kspar phenos alter weak, [illegible] chlorite.

Chs-1 - Table of Compos. Assays

0-1100	1100'	Approx.	.03% Cu or less				
1100-1650	550'	"	.09% Cu				
1650-2525	875'	"	.05% Cu or less				
2525-2665	140'		.15%	350'	.18%	455'	.16%
2665-2875	210'		.195%				
2875-2980	105'		.12%				
2980-3180	200'		.05%				
3180-3365	185'		.135%	425'	.19%		
3365-3605	240'		.233%				
3605-3905	300'		.053%				
3905-4002	97'		.169%				
2525-4002	1477'		.133%				

CHARLESTON PROJECT
Hole Chs-1

Depth	Cu	Mo	Pb	Zn
68-75	25	10	30	20
143-152	40	8	30	25
164-169	310	4	25	30
194-199	105	4	75	125
321-326	255	6	120	100
398-403	255	16	110	185
520-528	300	8	45	70
591-599	280	10	40	130
692-700	180	4	105	200
792-800	450	8	25	95
923-933	330	14	60	80
983-993	400	30	60	50
1087-1097	600	14	25	20
1257-1267	850	36	45	60
1347-1357	750	40	45	60
1442-1452	950	22	50	55
1552-1562	900	18	40	35
1632-1642	1350	14	35	20
1745-1754	20	22	30	5
1857-1867	235	2	15	10
1948-1958	610	6	35	40
1996-2006	475	4	20	5
2041-2051	135	30	20	5
2124-2134	1200	12	20	5
2207-2217	60	<2	10	5
2280-2290	630	2	10	10
2380-2390	620	10	10	5
2455-2465 10	1150	20	10	10
2525-2535 10	0.19%	12	1000	85
2612-2622 10	0.19%	18	20	20
2684-2694 10	0.19%	22	20	20
2787-2797 10	0.13%	16	15	15
2844-2854 10	0.41%	16	15	20
2919-2929	950	10	25	15
3011-3021 10	425	<2	15	15
3102-3112	495	2	10	15
3231-3241 10	1300	<2	10	30
3305-3315 10	0.20%	6	15	40
3401-3411 10	0.25%	10	15	15
3459-3469 10	0.21%	<2	10	35
3545-3554 9	0.23%	14	10	85
3626-3636	500	6	85	110
3710-3719	430	6	220	240
3849-3858 9	0.23%	18	15	35
3905-3914 9	0.26%	4	45	160
3979-3988 9	0.20	4	25	65
3992-4002 10	0.16	4	20	230

.18% .474' 400'

20. 120'

.20 .323' 325'

153'

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	As ppm
1	Chs-1 68-75	<0.2	25	30	20	10	
2	143-152	<0.2	40	30	25	8	
3	164-169 tr Cc ?	<0.2	310	25	30	4	
4	194-199		105	75	125	4	
5	321-326		255	120	100	6	5
6	Chs-1 398-403	<0.2	255	110	185	16	

J. R. K.
APR 2 1974

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:
Trace analysis

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 4/24/74 Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
4/20/74	4/24/74	740711

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CP-1	240-250		<0.2	15	50	185	2
2	CP-1	330-350		0.2	15	65	180	2
3	CP-1	370-395		<0.2	15	25	90	2
4	Chs-2	4351-4356	<0.02	<0.2	10	45	40	8
5		4470-4479	<0.02	<0.2	100	5	30	2
6		4742-4747	<0.02	<0.2	15	65	70	2
7		4971-4980	<0.02	<0.2	25	15	50	24
8	Chs-2	5012-5021	<0.02	<0.2	35	50	320	2

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK

TO: American Smelting & Refining Company

REMARKS:

CERTIFICATE:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	CHS-1 520-528			300	45	70	8			
2	591-599			280	40	130	10			
3	692-700			180	105	200	4			
4	792-800			450	25	95	8			
5	CHS-1 923-933	<0.02	<0.2	330	60	80	14			

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D: 4/26/74
DATE COMPL.: 4/30/74
JOB NUMBER: 740759

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CHS-1 983-993	400	60	50	30
2	CHS-1 1087-1097	600	25	20	14
3	CHS-1 1257-1267	850	45	60	36
4	CHS-1 1347-1357	750	45	60	40

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
5/2/74	5/7/74	740816

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu ppm	Pb ppm	Zn ppm	Mo ppm					
1	CHS-1	1442-1452	950	50	55	22					
2		1552-1562	900	40	35	18					
3		1632-1642	1350	35	20	14					
4	CHS-1	1745-1754	20	30	5	22					

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D: 5/9/74 | DATE COMPL.: 5/11/74 | JOB NUMBER: 74-0857

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	CHS-1	1857-1867			235	15	10	2			
2		1948-1958			610	35	40	6			
3		1996-2006			475	20	5	4			
4		2041-2051	<0.02	<0.2	135	20	5	30			
5	CHS-1	2124-2134			1200	20	5	12			

p:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:
Trace analysis

CERTIFIED BY:
Charles E. Thompson

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	As ppm		
1	CHS-1 2207-2217			60	10	5	< 2			
2	2280-2290			630	10	10	2			
3	2380-2390	<0.02	<0.2	620	10	5	10	28		
4	CHS-1 2455-2465			1150	10	10	20			

TO:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

Trace analysis

CERTIFIED BY:

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %	Pb ppm	Zn ppm	Mo ppm					
1	CHS-1 2612-2622	0.19	20	20	18					
2	CHS-1 2525-2535	0.19	1000	85	12					

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John R. King

REMARKS:
Trace analysis
Copper - single analysis

CERTIFIED BY:

DATE REC'D: 6/7/74

DATE COMPL.: 6/12/74

JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Cu %	Pb ppm	Zn ppm	Mo ppm	As ppm		
	Series Chs-1:									
1	2684-2694		>2000	0.19	20	20	22			
2	2787-2797		>2000	0.13	15	15	16			
3	2844-2854		>2000	0.41	15	20	16			
4	2919-2929	< 0.2	950		25	15	10			
5	2525-2535 (from 741062)	< 0.2						5		

TO:
American Smelting & Refining Co.
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona 85703

Attn: Mr. John R. King

REMARKS:
Trace analysis
3 Copper single analysis

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE No. 9427 CHARLES E. THOMPSON DATE SIGNED 5-17-84 Arizona U.S.A.

DATE REC'D:
DATE COMPL.:
JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Au ppm	Cu ppm	Cu %	Pb ppm	Zn ppm	Mo ppm			
1	Chs-1	3011-3021	<0.02	425		15	15	< 2			
2		3102-3112		495		10	15	2			
3		3231-3241		1300		10	30	< 2			
4		3305-3315		>2000	0.20	15	40	6			
5		3401-3411	<0.02	>2000	0.25	15	15	10			
6	Chs-1	3459-3469	<0.02	>2000	0.21	10	35	< 2			

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:
Trace analysis
3 Copper - single analysis

CERTIFIED BY:

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu ppm	Cu %	Pb ppm	Zn ppm	Mo ppm				
1	Chs-1	3545-3554	>2000	0.23	10	25	14				
2	Chs-1	3626-3636	500		85	110	6				
3	Chs-1	3710-3719	435		220	240	6				

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. Steven R. Davis

REMARKS:

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
7/5/74	7/9/74	741246

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %	Pb ppm	Zn ppm	Mo ppm					
1	Chs-1 3849-3858	0.23	15	35	18					
2	Chs-1 3905-3914	0.26	45	160	4					

J. R. K.
JUL 19 1974

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK Arizona U. S.

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn: Mr. S. R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
7/9/74	7/12/74	74-1282

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %	Pb ppm	Zn ppm	Mo ppm	Au	Ag	As		
1	Chs-1 3979-3988	0.20	25	65	4					
2	Chs-1 3992-4002	0.16	20	230	4					

Reing for Au Ag As

J. R. K.

JUL 19 1974

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn: Mr. S. R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck 7/18/74

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE ISSUED Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
7/11/74	7/16/74	741301

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	As ppm						
1	Chs-1 3979-3988	<0.02	0.6	< 1						
2	Chs-1 3992-4002	<0.02	0.8	< 1						

O:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S.R. Davis

REMARKS:

Trace analysis

CERTIFIED BY:

DATE REC'D:

DATE COMPL.: 7/29/74

JOB NUMBER: 7/1201-A

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Arizona Registered Assayer
William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu %
1	CHS - 1	2535-2545	0.08
2		2545-2555	0.09
3		2555-2565	0.20
4		2565-2575	0.15
5		2575-2585	0.13
6		2585-2595	0.16
7		2595-2605	0.08
8		2605-2612	0.15
9		2622-2632	0.14
10		2632-2642	0.13
11		2642-2652	0.21
12	CHS - 1	2652-2662	0.17

TO:
American Smelting & Refining Co.
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona 85703

Attn: Mr. W. L. Kurtz

REMARKS:
Single determinations

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 8/13/74 ARIZONA U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
8/5/74	8/13/74	741520

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %
	Series CHS-1	
1	2662-2672	0.11
2	2672-2684	0.11
3	2694-2705	0.30
4	2705-2715	0.15
5	2715-2725	0.16
6	2725-2735	0.18
7	2735-2745	0.21
8	2745-2755	0.21
9	2755-2765	0.17
10	2765-2775	0.19
11	2775-2787	0.25
12	2797-2807	0.22
13	2807-2817	0.20
14	2817-2827	0.22
15	2827-2837	0.18
16	2837-2844	0.17

J. R. K.
AUG 2 9 1974

0060
JRK

TO:
American Smelting & Refining Co.
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attention: Mr. John R. King

REMARKS:
Single determinations

CERTIFIED BY:
William L. Lehmbeck
8/23/74

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
ARIZONA, U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
8/22/74	8/23/74	741656

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

J. P. K

AUG 29 1974

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %
1	CHS - 1 2854-2865	0.26
2	2865-2875	0.24
3	2875-2885	0.15
4	2885-2895	0.18
5	2895-2905	0.12
6	2905-2915	0.10
7	2915-2919	0.10
8	2929-2940	0.14
9	2940-2950	0.12
10	2950-2960	0.12
11	2960-2970	0.11
12	2970-2980	0.09
13	2980-2990	0.05
14	2990-3000	0.05
15	3000-3011	0.05
16	3021-3030	0.03
17	3030-3040	0.05
18	3040-3050	0.04
19	3050-3060	0.04
20	3060-3070	0.04
21	3070-3080	0.04
22	3080-3090	0.10
23	3090-3103	0.08
24	3112-3120	0.06
25	3120-3130	0.04
26	3130-3140	0.09
27	3140-3150	0.09
28	CHS - 1 3150-3160	0.09

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John King

REMARKS:
Single analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
8/26/74	8/29/74	741694

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Arizona Registered Assayer No. 9427
William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu %
1	CHS-1	3160-3170	0.05
2		3170-3180	0.05
3		3180-3190	0.13
4		3190-3200	0.12
5		3200-3210	0.10
6		3210-3220	0.14
7		3220-3232 *	0.11
8		3242-3250 **	0.09
9		3250-3260	0.16
10		3260-3270	0.08
11		3270-3280	0.10
12		3280-3290	0.14
13		3290-3305	0.20
14		3315-3325	0.19
15		3325-3335	0.20
16		3335-3345	0.09
17		3345-3355	0.06
18		3355-3365	0.15
19		3365-3375	0.20
20		3375-3385	0.22
21		3385-3401	0.25
22		3411-3420	0.25
23		3420-3430	0.20
24		3430-3440	0.09
25		3440-3450	0.16
26		3450-3459	0.18
27		3469-3480	0.26
28		3480-3490	0.24
29		3490-3500	0.28
30		3500-3510	0.19
31		3510-3520	0.29
32		3520-3530	0.15
33		3530-3545	0.33
34		3554-3565	0.26
35	CHS-1	3565-3575	0.16

TO:
American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S. R. Davis

REMARKS:
* Sample marked 3220-3231
** Sample marked 3241-3250

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
9/13/74	9/23/74	741873

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Arizona Registered Assayer No. 9427
William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu %
36	CHS-1	3575-3585	0.35
37		3585-3595	0.32
38		3595-3605	0.22 fault
39		3605-3615	0.07
40		3615-3626	0.09
41		3636-3645	0.05
42		3645-3655	0.02
43		3655-3665	0.04
44		3665-3675	0.03
45		3675-3685	0.01
46		3685-3695	0.01
47		3695-3710	0.03
48		3719-3730	0.07
49		3730-3740	0.01
50		3740-3750	0.02
51		3750-3760	0.03
52		3760-3770	0.03
53		3770-3780	0.02
54		3780-3790	0.03
55		3790-3800	0.04
56		3800-3810	0.03
57		3810-3820	0.04
58		3820-3830	0.07
59		3830-3840	0.06
60		3840-3849	0.12
61		3858-3870	0.07
62		3870-3880	0.07
63		3880-3890	0.06
64		3890-3905	0.08
65		3914-3925	0.21
66		3925-3935	0.08
67		3935-3945	0.17
68		3945-3955	0.15
69		3955-3965	0.09
70		3965-3979	0.22
71	CHS-1	3988-3992	0.09

TO: Cyprus Bagdad Copper 3/12/75

REMARKS:

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 9/23/74 ARIZONA U.S.A.

Page 2 of 2

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
9/13/74	9/23/74	741873

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Arizona Registered Assayer No. 9427
William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm				
1	CHS-2	50-60	<0.2	5	10	65	< 2				
2		150-160	<0.2	35	15	95	< 2				
3		250-260	<0.2	10	15	60	2				
4		350-360	<0.2	5	10	75	< 2				
5		450-460	<0.2	45	35	120	< 2				
6		550-560	<0.2	10	50	65	< 2				
7		650-660	<0.2	5	20	65	< 2				
8		750-760	<0.2	5	20	65	< 2				
9		850-860	<0.2	15	30	65	< 2				
10	CHS-2	950-960	<0.2	5	35	35	< 2				

TO:
American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S. R. Davis

REMARKS:

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
9/27/74	10/2/74	741959

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
P.O. Box 50106, 1700 W. Grant Rd., Tucson, Arizona 85703

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CHS-2 1050-1060	<0.2	10	65	75	2
2	1150-1160	<0.2	10	30	5	2
3	1250-1260	<0.2	55	15	130	< 2
4	1350-1360	<0.2	40	20	85	< 2
5	1450-1460	<0.2	5	15	35	2
6	1550-1560	<0.2	25	30	70	< 2
7	1650-1660	<0.2	5	10	35	< 2
8	1750-1760	<0.2	10	10	50	< 2
9	1850-1860	<0.2	15	50	130	2
10	1950-1960	<0.2	10	20	65	2
11	2050-2060	<0.2	5	15	70	2
12	2150-2160	<0.2	15	100	70	2
13	2190-2200	<0.2	5	20	5	2
14	2200-2210	<0.2	115	10	5	2
15	2210-2220	<0.2	35	15	50	2
16	CHS-2 2250-2260	<0.2	10	25	40	2

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

CERTIFIED BY:

Attn.: Mr. S. R. Davis

DATE REC'D: 9/30/74

DATE COMPL.: 10/7/74

741973

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm				
1	Chs-2 2911-2913	20.	485	5400	7600	< 2				

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

Trace analysis

CERTIFIED BY: LEHMBECK

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm				
1	Chs-2 2988-2998	0.2	25	15	35	2				
2	Chs-2 3243-3253	0.6	210	1800	2100	2				

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

SAMPLE IDENTIFICATION	GOLD ppm	SILVER	COPPER	LEAD	ZINC ppm	MO ppm			
Chs-2 3243-3253	<0.02								

TO: American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John R. King

REMARKS:

2 Gold @ $2.50
1 Zinc - 1.25
1 Molybdenum - $1.50

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA

DATE SIGNED: 11/14/74

CHARGES:
PREPARATION $
ANALYSIS $ 7.75

DATE REC'D:	DATE COMPL.:	JOB NUMBER:	$
	11/11/74	742154-A	7.75

TO: American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

CERTIFIED BY: William L. Lehmbeck

11/14/74

DATE REC'D:	DATE COMPL.:	JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	Chs-2 3378-3388	<0.02	<0.2	55	55	250	< 2			

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARXS:

CERTIFIED BY: William L. Lehmbeck

DATE 11/19/77

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu %	Pb ppm	Zn ppm	Mo ppm			
	Chs-2 W 4205-4215	<0.02	27	1.04	295	220	< 2			

TO: American Smelting & Refining Co.
Southwestern Exploration Div.
P. O. Box 5747
Tucson, Arizona 85703

Attn: Mr. John King

REMARKS:

CERTIFIED BY:

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
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Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu %	Pb ppm	Zn ppm				
1	Chs 4195-4205	<0.02	6.6	0.53	210	530				

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

CERTIFIED BY:

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
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(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	CP-1 240-250		<0.2	15	50	185	2			
2	CP-1 330-350		0.2	15	65	180	2			
3	CP-1 370-395		<0.2	15	25	90	2			
4	Chs-2 4351-4356	<0.02	<0.2	10	45	40	8			
5	4470-4479	<0.02	<0.2	100	5	30	2			
6	4742-4747	<0.02	<0.2	15	65	70	2			
7	4971-4980	<0.02	<0.2	25	15	50	24			
8	Chs-2 5012-5021	<0.02	<0.2	35	50	320	2			

TO:

REMARKS:

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK

Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	Chs-3 201-211	<0.02	<0.2	220	140	165	2
2	602-610	<0.02	<0.2	110	65	65	8
3	948-958	<0.02	<0.2	60	70	80	8
4	1213-1223	<0.02	<0.2	50	30	45	2
5	1486-1496	<0.02	3.2	870	820	1850	14
6	1577-1587	<0.02	0.2	185	35	110	6
7	2167-2176	<0.02	<0.2	295	40	50	16
8	2789-2799	<0.02	<0.2	940	70	55	12

26

TO: erican Smelting & Refining Company
thwestern Exploration Division
. O. Box 5747
Tucson, Arizona 85703
Attn: Mr. John R. King

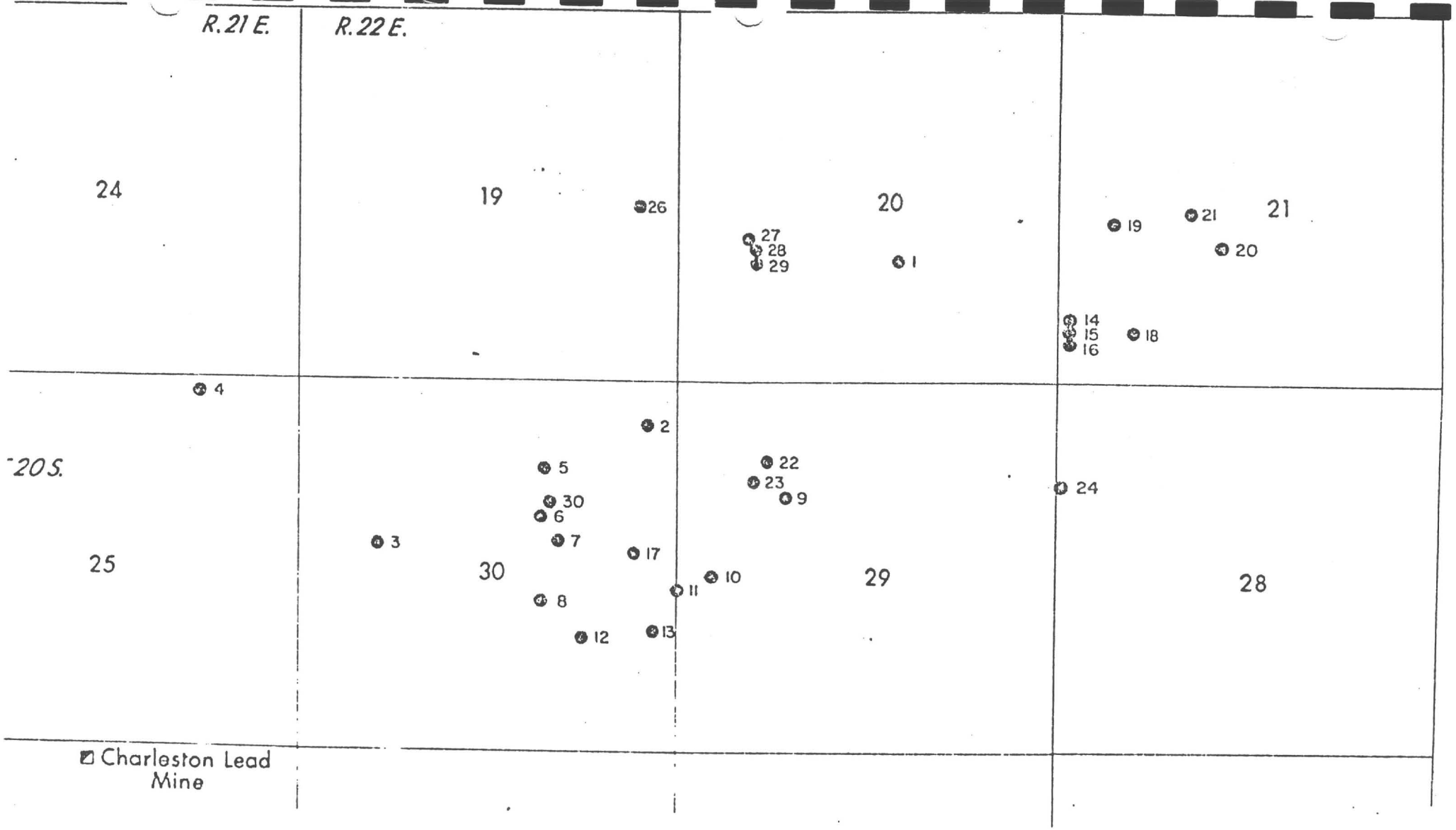
REMARKS: Trace analysis

CERTIFIED BY: REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA U.S.A.

DATE REC'D: 8/12/75

DATE COMPL.:

JOB NUMBER:



SAMPLE SITES
GEOCHEMICAL OVERLAY
CHARLESTON MINING DISTRICT
COCHISE CO., ARIZONA

scale 1:24,000 SEPT, 1973

3226 East 46th Street

Phone ~~621-03~~ 887-57

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS · CHEMISTS · METALLURGISTS

TUCSON, ARIZONA 85713

JUL 2 1973

SAMPLE SUBMITTED BY American Smelting & Refining Co.

DATE June 30, 1973

SAMPLE MARKED	GOLD OZ/TON	SILVER OZ./TON	PPM COPPER	PPM LEAD	PPM ZINC	PPM MOLYBDENUM	PERCENT IRON	
TB - 1			20	131	22	25		
TB - 2			48	81	24	25		
TB - 3			161	2000+	71	33		
TB - 4			14	183	8	40		
TB - 5			68	724	666	53		
TB - 6			23	96	17	20		
TB - 7			46	44	34	17		
TB - 8			41	40	18	16		
TB - 9			14	66	8	32		
TB -10			92	44	11	20		
B -11			35	33	79	17		
TB -12			26	39	9	13		
TB -13			19	65	61	17		
TB -14			11	21	59	22		
TB -15			21	22	57	25		
TB -16			36	18	91	20		

REGISTERED ASSAYER

CERTIFICATE NO. 2357

FLORES

Invoice # 9411

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS · CHEMISTS · METALLURGISTS

TUCSON, ARIZONA 85713

SAMPLE SUBMITTED BY American Smelting & Refining Company

DATE August 29, 1973

SAMPLE MARKED	GOLD OZ./TON	SILVER OZ./TON	PPM COPPER	PPM LEAD	PPM ZINC	PPM MOLYBDENUM	PERCENT IRON	
TB - 17			39	200	24	19		
TB - 18			108	107	49	14		
TB - 19			26	42	25	13		
TB - 20			40	90	30	14		
TB - 21			25	49	57	10		
TB - 22			23	189	21	11		
TB - 23			25	105	17	19		
TB - 24			33	133	50	23		
TB - 25			54	879	29	12		
TB - 26			30	31	63	13		
) - 27			37	129	61	12		
TB - 28			26	36	69	11		
TB - 29			68	38	107	12		
TB - 30			28	40	80	16		
[redacted]			[redacted]	[redacted]	[redacted]	[redacted]		

8/29/73

Invoice # 9716

THIN SECTION REPORT OF SPECIMENS

FROM CHARLESTON MINE

September 24, 1969

No. C-69-3977

Location: U.S.A.; Charleston Mine; Hole #4 @ 1,481'; H. L. Jones, Albuquerque, N. Mexico; Assay No. E-7853.

Classification: Highly altered rhyodacitic volcanic. Strongly carbonatized and saussuritized. Contains about 5% euhedral pyrite, minor v.f.g. disseminated sphalerite, and a trace of chalcopyrite. No molybdenite is present.

No. C-69-3978

Location: Ditto -3977; @ 1,500'; Assay No. E-7854.

Classification: Sample consists of small fragments up to 1/2" in size. Mineralogy as follows:

pale golden yellow sphalerite	60%
galena	10%
pyrite	5%
chalcopyrite	15%
gangue	10%

The sulphides are c.g. except for pyrite which is almost invariably surrounded and corroded by chalcopyrite. No molybdenite.

P.S. enriched in sulphide relative to sample.

No. C-69-3979

Location: Ditto -3977; @ 1,546'; Assay No. E-7855.

Classification: Porphyritic rhyodacite. Consists of rounded and corroded phenocrysts of quartz, phenocrysts of plagioclase and a rhyodacitic matrix. Sulphide mineralization is restricted to minor, f.g., disseminated pyrite.

EFP/lk

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THIN SECTION REPORT

ON CHARLESTON PROPERTY

November 5, 1969

Preliminary thin section work was done on fifty-four diamond drill core specimens from borehole #4, Charleston Property. The specimen classification with brief explanatory notes is presented below:

Sample	Footage	Classification	Remarks
S69-920	1435'	Quartzite	Consists to over 90% of quartz grains with overgrowth in fg cementing quartz-chlorite matrix. Minor carbonate, feldspar. Well sorted.
S69-921	1460'	Quartzite	Ditto S69-920
S69-922	1477'	Quartzite	Ditto S69-920
S69-923	1488'	Quartzite	Ditto S69-920
S69-924	1506'	Quartz-andesite porphyry	Fg plagioclase-chlorite-(hornblende) matrix with phenocryst of quartz, partly saussuritized plagioclase and hornblende. Minor carbonate replacement. Green colour of phenocrysts in hand specimen is due to epidote replacing plagioclase.
S69-925	1520'	Quartz-andesite porphyry	Ditto S69-924
S69-926	1535'	Quartz-andesite porphyry	Ditto S69-924
69-927	1570'	Quartz-andesite porphyry	Ditto S69-924

Sample	Footage	Classification	Remarks
S69-928	1604'	Lapilli tuff	Aphanitic quartz-chlorite rich matrix, holds strongly altered fragments of silicates, now largely consisting of epidote and carbonate. Some admixed clastic material.
S69-929	1630'	Tuffaceous sandstone, possibly brecciated	Very fragmental; partly a poorly sorted quartzite, but mostly a fg chlorite carbonate rock with particles of angular quartzite. Strong carbonate metasomatism.
S69-930	1640'	Tuffaceous sandstone to greywacke	A fg quartz-chlorite matrix holds abundant angular grains of quartz and some volcanic rock fragments.
S69-931	1650'	Quartzite, poorly sorted	Abundant angular quartz cemented by fg quartz matrix, partly replaced by carbonate with epidote. Some sericite.
S69-932	1670'	Arkosic quartzite	Poorly sorted, more plagioclase grains than in S69-931.
S69-933	1700'	Quartzite, poorly sorted	Mostly quartz cemented by quartz-sericite-chlorite. Some zeolites.
S69-934	1704'	Quartzite, poorly sorted	As S69-933
S69-935	1747'	Quartzite	As S69-920; quartz shows overgrowth.
S69=936	1768'	Quartz-andesite porphyry	Ditto S69-924
S69-937	1788'	Andesite porphyry	Ditto S69-924, no quartz phenocrysts
S69-938	1800'	Recrystallized greywacke?	Fragmental. A matrix of lathy quartz contains fragments of tuff, chloritic volcanics. Abundant disseminated pyrite cubes. True nature of this rock remains doubtful.

Sample	Footage	Classification	Remarks
S69-939	1812'	Arkosic quartzite	Ditto S69-932
S69-940	1817'	Recrystallized quartzite	Consists essentially of lathy quartz, some carbon metasomatism.
S69-941	1830'	Quartzite	Ditto S69-920
S69-942	1840'	Altered intermed. volcanic	Basically an altered andesite without phenocrysts
S69-943	1860'	Arkosic quartzite	Poorly sorted, as S69-932
S69-944	1880'	Arkosic quartzite	Poorly sorted.
S69-945	1890'	Quartzite	Ditto S69-920
S69-946	1898'	Quartzite	A somewhat pebbly appearance, otherwise as entry above.
S69-947	1900'	Quartzite	Ditto S69-920
S69-948	1902'	Tuffaceous sandstone?	Very fg matrix with clastic quartz grains, disseminated pyrite. Border case between a type of mudstone and tuffaceous sandstone.
S69-949	1930'	Quartzite	Ditto S69-920, but more interstitial fg matrix with much epidote and carbonate. Minor feldspar.
S69-950	1950'	Quartzite	Poorly sorted, ditto S69-931
S69-951	1975'	Quartzite	Poorly sorted, ditto S69-931
S69-952	1994'	Altered tuff	Much replacement by carbonate in coarse particles, and by epidote-amphibole in an interlocking intergrowth.
S69-953	2002'	Greywacke	Contains abundant clastic quartz and lithic fragments in a very fg interstial quartz-chlorite-carbonate matrix.

Sample	Footage	Classification	Remarks
S69-954	2007'	Arkosic quartzite	Ditto S69-932, with abundant clastic feldspar.
S69-955	2045'	Dacite porphyry	Basically a quartz-feldspar porphyry, strong carbonate-epidote alteration. In general more sodic and silica rich than the quartz-andesite porphyries
S69-956	2070'	Arkosic quartzite	Ditto S69-954
S69-957	2090'	Arkosic quartzite	Ditto S69-954, transitional to a greywacke.
S69-958	2115'	Tuffaceous sandstone	Mixture of clastic quartz and lithic fragments in very fg matrix; similar to S69-930.
S69-959	2125'	Tuffaceous sandstone	As above entry, less coarse particles, much matrix of ashy nature.
S69-960	2140'	Quartzite	Poorly sorted, ditto S69-931
S69-961	2150'	Quartzite	As above entry
S69-962	2180'	Quartzite	Ditto S69-920; well sorted with overgrowth of quartz.
S69-963	2210'	Greywacke	Similar to S69-953. Mixture of clastic particles in an interstial fg quartz-chlorite-sericite-carbonate matrix.
S69-964	2240'	Arkosic quartzite	Transitional to a greywacke and a quartzite. Similar to S69-956
S69-965	2256'	Andesite porphyry	Ditto S69-937
S69-966	2276'	Andesite porphyry	Ditto S69-937
S69-967	2290'	Andesite porphyry	Ditto S69-937
S69-968	2300'	Quartzite	Poorly sorted, angular quartz, as S69-931

Sample	Footage	Classification	Remarks
S69-969	2330'	Tuff	A tuff with minor quartz sand; some lapilli; minor epidote.
S69-970	2340'	Tuffaceous sandstone	Mixture of quartz and lithic fragments in an ashy matrix; similar to S69-958
S69-971	2364'	Tuff to tuffaceous sandstone	Similar to above entry, finer grained.
S69-972	2374'	Tuff	Similar to S69-969
S69-973	2386'	Tuff	Similar to S69-969

POLISHED SECTION REPORT

ON CHARLESTON MINE

October 28, 1969

Three chips of diamond drill core from borehole #4, Charleston Property, Arizona, were received for polished section examination. The footages of the three specimens are given as: 1729' (S69-915); 1890' (S69-916) and 2424' (S69-917).

Specimen S69-915 @ 1729': A fine grained quartz-feldspar rich rock (latite?) carries about 5% disseminated sulfides. These are major pyrite, minor sphalerite, some galena and a very few specks of chalcopyrite. Pyrite occurs as euhedral cubes measuring up to 400 microns in diameter. Sphalerite forms very ragged, amoeba-like particles (figure 1) ranging in size up to one millimeter across. Smaller and more euhedral sphalerite grains are scattered throughout the rock matrix in minor amounts. Galena is present in trace amounts, usually in close association with sphalerite. Figure 1 shows a typical occurrence of galena as inclusions in sphalerite and as an intermittent rim around the sphalerite particle. In other places galena occurs as small isolated grains in the rock matrix. Small specks of chalcopyrite are found as inclusions in sphalerite.

Pyrite does not contain any visible inclusions of sphalerite, galena or chalcopyrite, but carries numerous inclusions of gangue constituents. A rough estimate of the relative sulfide proportion in the rock is about 85% pyrite, 10% sphalerite, $\leq$5% galena and <<1% chalcopyrite.

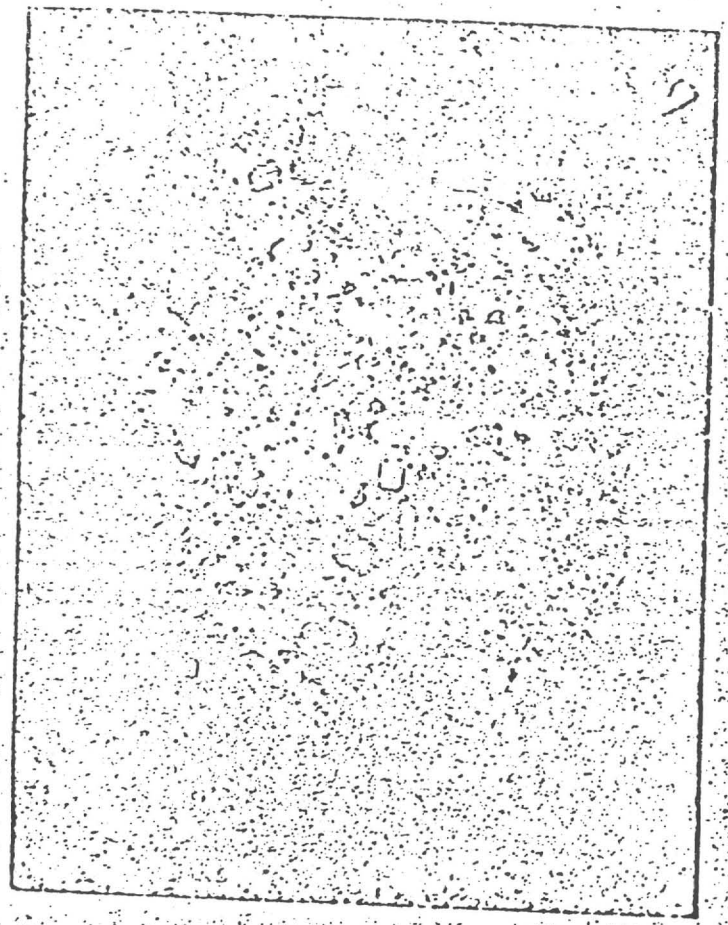
Specimen S69-916 @ 1890': A fine grained quartz rich rock with about 12 to 15% sulfides. Again the bulk of the sulfides is pyrite, here forming coarse grained lensoid to stringery aggregates. A small proportion of pyrite occurs as small disseminated euhedral grains in the rock matrix. Sphalerite and galena are present in minor amounts and form

29

angular disseminated grains, again showing a close affinity for each other (figure 2). Chalcopyrite occurs as small inclusions in sphalerite and also as minute grains disseminated throughout the matrix.

Sphalerite in this specimen lacks the ragged, amoeba shaped grain boundaries. It may contain inclusions of galena and chalcopyrite. Pyrite is full of inclusions of gangue constituents but free of other sulfide components. The relative sulfide proportions are estimated at 90% pyrite, 5% sphalerite and galena each and a trace of chalcopyrite. Silver minerals and lead sulfosalts were not observed.

Specimen S69-917 @ 2424': A fine grained volcanic (?) containing about 7% disseminated sulfides. These are mainly coarse grains of pyrite, small particles of sphalerite and a few specks of chalcopyrite. Galena was not observed.

Pyrite tends to form stringery aggregates measuring up to five millimeter in length. The individual euhedral pyrite grains measure up to half a millimeter across. Gangue inclusions in pyrite are less common than in the other two specimens, but a few minute specks of chalcopyrite were seen in some of the pyrites. Sphalerite is present as disseminated grains measuring up to 100 microns across. The relative sulfide proportions are roughly 95% pyrite, >3% sphalerite and <2% chalcopyrite.

The specimens were submitted for chemical analysis; the assay data will be reported when they become available.