COPPER SPRINGS PROSPECT

SUMMIT MINING DISTRICT, GILA COUNTY, ARIZONA

R. M. Corn

May, 1997

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Summary

The Copper Springs porphyry copper prospect is an easily leached, near-surface, chalcocite enrichment blanket and associated shear zone-hosted chalcocite/oxide copper mineralization with copper values of approximately .35 to .40 percent copper. The prospect is on the west side of an extensive porphyry alteration system located approximately six miles south of Miami, Arizona and the chalcocite mineralization has not been fully defined by previous exploration. In the enrichment blanket, copper occurs as easily leached "sooty" chalcocite coating pyrite in non-reactive schist. The chalcocite enrichment blanket is draped parallel to topography and is self-leaching, with copper currently migrating downslope to be reprecipitated at lower elevations.

Previous drilling indicates a possible exploration potential of approximately 40 million tons of .35 to .40 percent copper for the chalcocite blanket. In addition, substantial amounts of supergene copper are localized along permeable sheared and fractured zones as indicated by the drilling on the Ellis shear zone, and the prominent oxide copper minerals along the Santa Anna Fault zone and in the wide zone of sheared and fractured rock on the west side of the enrichment blanket. The shear zones were not evaluated during previous exploration. They represent zones of enhanced permeability that were favorable for supergene copper migration and higher-grade supergene chalcocite/oxide copper mineralization. The chalcocite blanket and the associated shear zone-hosted mineralization have a significant exploration potential and constitute a copper resource amenable to open pit mining and low-cost, heap-leach, SX - EW treatment.

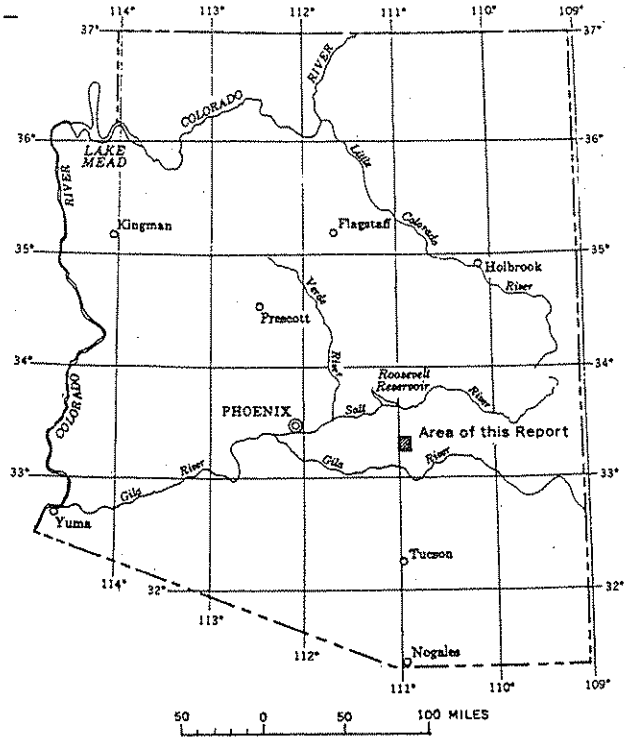
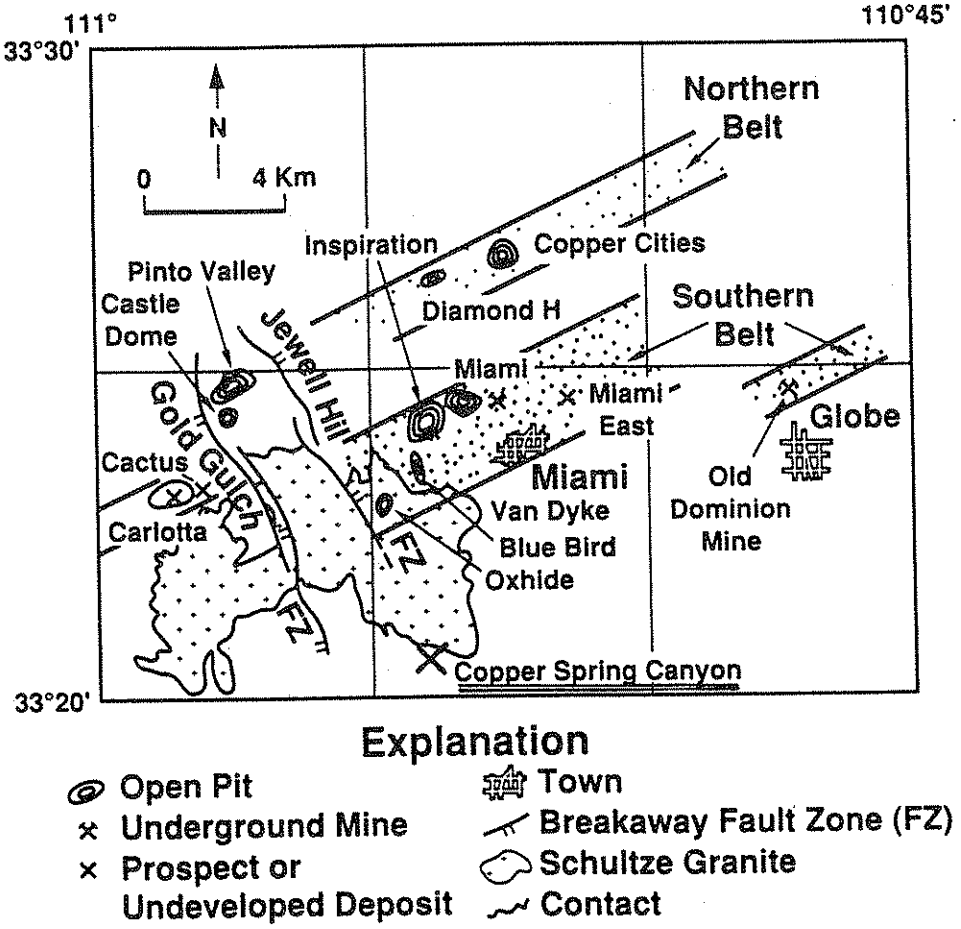


FIGURE 1.—Index map of Arizona.



INDEX MAP SHOWING THE LOCATION OF THE COPPER SPRINGS PROSPECT AND COPPER DEPOSITS IN THE GLOBE-MIAMI DISTRICT, ARIZONA

General

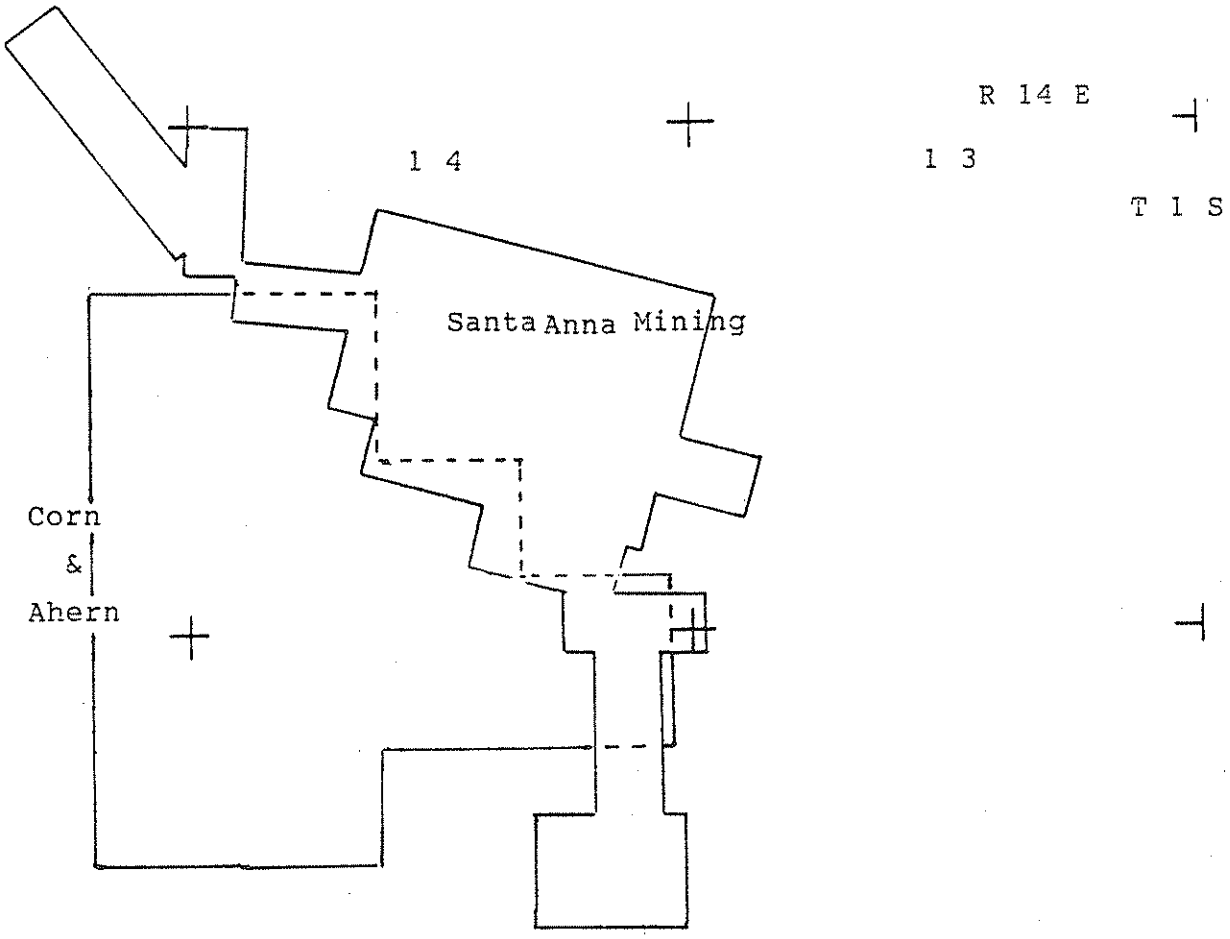
The Copper Springs alteration system extends over an area of approximately five square miles in and near Sections 13, 14, 23 and 24, T. 1 S., R. 14 E., Gila County, Arizona and is centered on the south lobe of the Laramide Schultze granite, approximately six miles south of the Inspiration porphyry copper deposit. The chalcocite blanket is located in the south half of Section 14, primarily on unpatented claims held by Corn & Ahern while adjacent unpatented claims over low-sulfide primary chalcopyrite mineralization are held by members of the Santa Anna family. The geologic data and interpretations presented in this report are based on previous field work in the area correlated and combined with drill hole and geologic data from the USGS, Miami Copper Co., Kerr-McGee Corp., Humble Oil Co. (Exxon) and others.

The large-scale alteration - mineralization zoning pattern is reflected by geochemical data (Mo), the distribution and habit of sulfide minerals, and changes in the pyrite to chalcopyrite ratio in the sulfides. The center of the alteration system is a "barren core" that exhibits potassic alteration characterized by secondary feldspar and biotite, occasional quartz veinlets and little or no sulfides. The low-sulfide potassic altered core is surrounded by a zone of mixed potassic-phyllic alteration approximately 1,000 feet wide that is characterized by secondary orthoclase and biotite and quartz-sulfide-sericite veinlets. Indicated copper values are approximately .15 to .20 percent and the pyrite to chalcopyrite ratio is about 1 to 1, increasing outward. The 1 to 1.5 percent total sulfide content is too low to promote supergene enrichment. The exterior, low-sulfide pyritic alteration does not contain prominent secondary orthoclase and biotite. There are relatively few quartz-sulfide veinlets, pyrite is the dominant sulfide, the pyrite to chalcopyrite ratio is 10 to 1 or greater, and the sulfide content gradually decreases outwards. Exterior to the pyritic alteration the granite and schist appear relatively unaltered but are less resistant to erosion and exhibit scattered pyritic veins and pyritized shear zones.

The Copper Springs alteration system is illustrated on the accompanying 1:24,000 scale geologic map and sections. The alteration pattern is best defined by both patterns of sulfide distribution and the metal ratios in the sulfides. Although the Pinal schist usually contains substantially more total sulfides than the granite, the patterns of introduced metals and the chalcopyrite to pyrite ratios in the introduced sulfides appear independent of rock type. The alteration system is elongate east-west and appears to be structurally rotated, perhaps as much as 60 degrees, with the top to the west. As shown on the accompanying sections, the mineralization encountered in Miami Copper Co.'s churn drill holes, CDH 301 and CDH 303, various shallow drill holes, and Humble' two deep drill holes, CS-A and CS-B, support this interpretation.

LAND MAP

COPPER SPRINGS CANYON, GILA COUNTY, ARIZONA

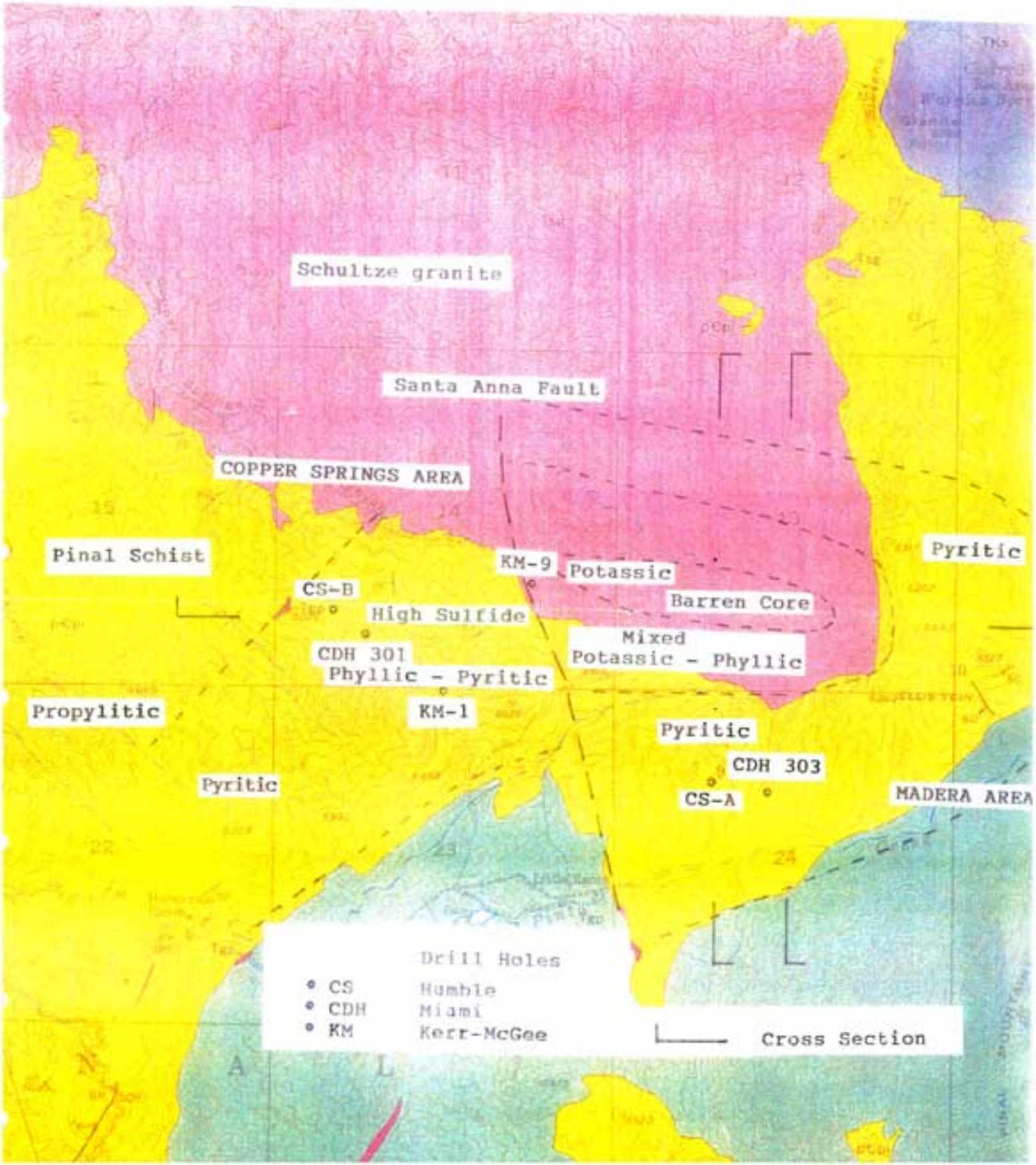


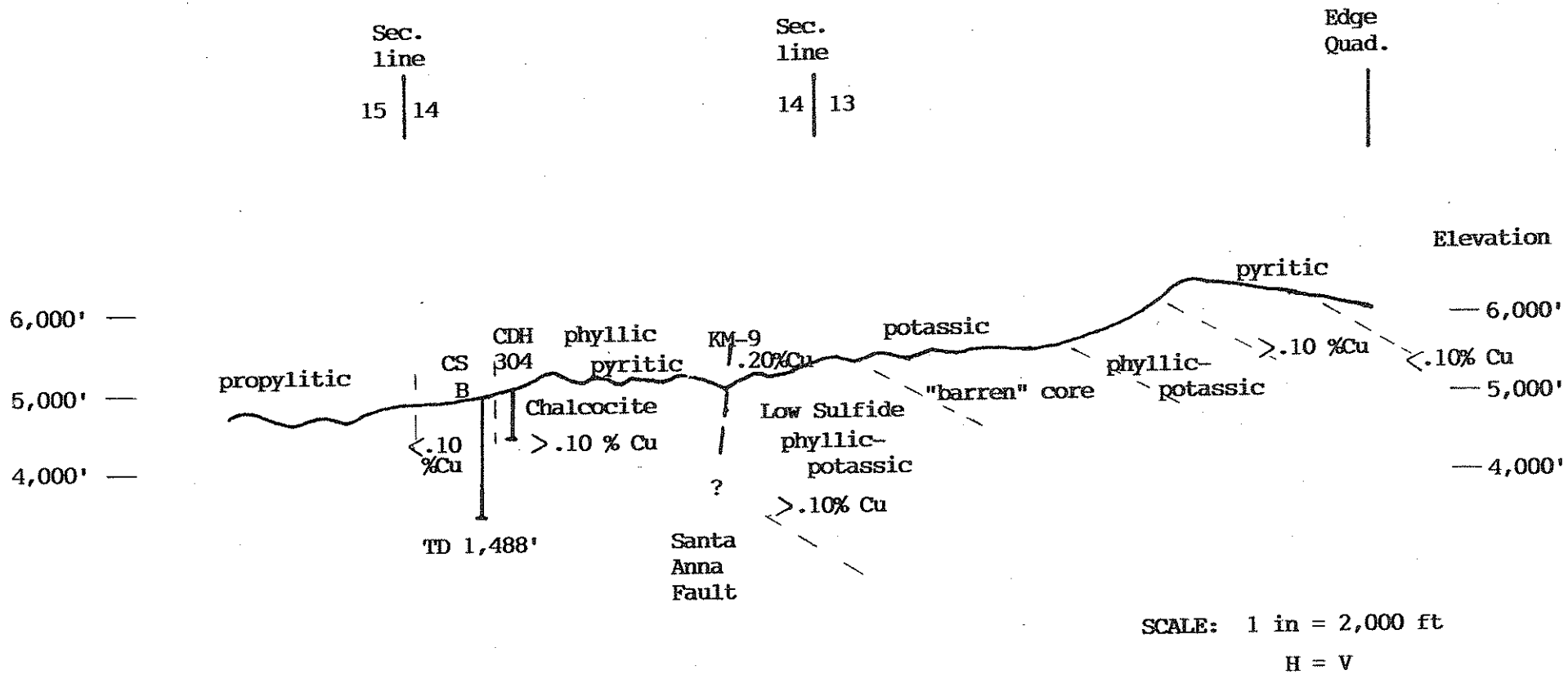
GENERALIZED ALTERATION PATTERN - COPPER SPRINGS PROSPECT

Summit Mining District, Gila County, Arizona

SCALE
1 inch = 2,000 feet

Geology from USGS Bull 1141-H
R. M. Corn Feb., 1995

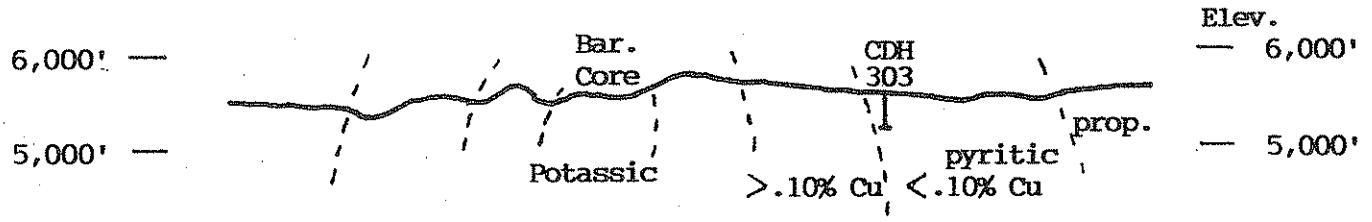




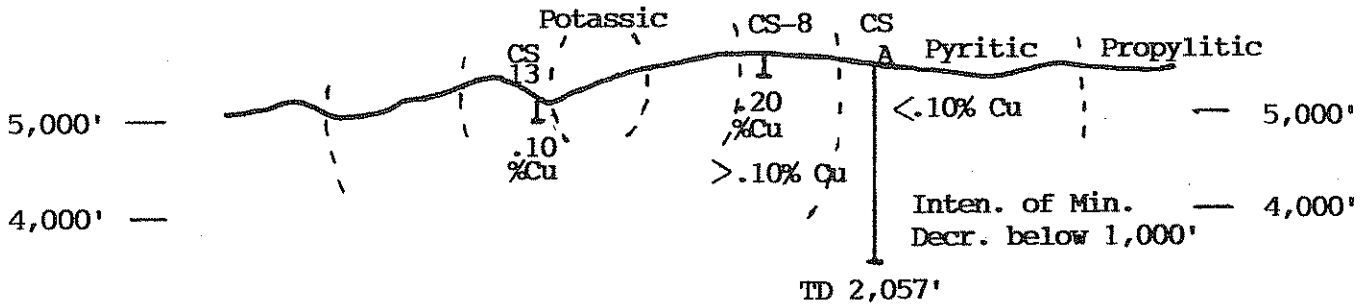
East - West Section Through Copper Springs Alteration System

1,000 Feet North of South Edge of Section 14

(Looking North)



N - S Section Through Center of Section 13
(Looking East)



N - S Section Through DDH CS - A
1,000 Feet West of The Center of Section 13
(Looking East)

SCALE: 1 in. = 2,000 ft
H = V

The alteration system is disrupted by the Santa Anna Fault, a major fault of unknown displacement that strikes north-south, dips 60 to 70 degrees west, and is reflected by a poorly exposed 50 to 100 foot wide zone of intense shearing and brecciation. The trace of the fault is marked by major offsets in the schist-diorite and schist-granite contacts as well as a prominent topographic "low" near Santa Anna's Camp in the SE¼ of Section 14. The fault separates two distinct parts of the alteration system; the eastern or Madera area, characterized by low total sulfides, and a western area of higher-sulfide, phyllic altered schist that contains the supergene chalcocite blanket at Copper Springs.

Previous Exploration

The Copper Springs alteration system was explored by Miami Copper Co. (4 drill holes, 1947-1948), Kerr-McGee Corp. (12 drill holes, 1964-1967), Phelps Dodge Corp. (1 drill hole, 1967) and Humble Oil Co. (14 drill holes which included two deep drill holes, CS-A and CS-B and an additional 20 shallow validation holes, 1969-1970). Phoenix Ventures reportedly drilled several shallow BX core holes in the area of the chalcocite blanket at Copper Springs in 1966, but their data is not available. Consolidated Uranium Co. drilled 2 holes across the Ellis shear zone in the Madera part of the system in 1957 and E+E Management Corp. also explored the Madera area with 4 drill holes in 1970. The drill holes are plotted on accompanying 1 in. equal 500 ft. scale maps. Drill hole locations were taken from maps in earlier drilling reports.

The previous exploration at Copper Springs was directed primarily toward the potential of the indicated chalcocite enrichment blanket. Miami Copper Co. drilled two holes, CDH 301 and CDH 302, based on leached capping interpretation, in and near the SW¼ of Section 14 in 1947. The Kerr-McGee exploration program in 1964 included seven holes directed toward the chalcocite mineralization and the possibility that more chalcocite would be preserved at higher elevations. Kerr-McGee reported an indicated resource of 17 million tons averaging .37 percent copper in a chalcocite blanket averaging 65 feet thick. Humble's exploration program in 1969 was directed toward evaluating the chalcocite mineralization for its potential as an in-situ or heap leach resource. They tested the area of chalcocite mineralization indicated by Kerr-McGee with shallow, non-reverse circulation, rotary-hammer/core holes spaced on a rough 800 foot square grid. As a result of this drilling, they reported a resource of 37 million tons of .26 percent copper. However, the copper values reported by Humble were biased toward lower grades because of dilution during drilling and are not a valid indication of the grade of the chalcocite mineralization. Humble also did not consider geologic factors in positioning their drill holes and interpreted the chalcocite mineralization as a horizontal blanket so that their exterior, very shallow holes, were not of sufficient depth to have tested chalcocite mineralization draped parallel

to topography. The available data on the previous drilling is scattered among several different Company drilling reports. The combined data on drill hole depths and intercepts of chalcocite mineralization for holes in and near the chalcocite blanket at Copper Springs are shown on an accompanying table.

The poor correlation between the copper values reported by Humble for the chalcocite mineralization in their drill holes at Copper Springs and the copper values reported from the earlier Kerr-McGee core holes and the Miami churn drill holes, appears to reflect dilution during the Humble drilling. Most of the Humble drill holes were very shallow and were drilled by a combination of (non-reverse circulation) rotary-hammer drilling and coring. Humble's detailed drill logs were not available and it is not known if there were drilling problems or if their samples were representative. Copper values reported by Humble were uniformly lower than the values in adjacent earlier drill holes and the Humble results should not be considered indicative of the grade of the chalcocite mineralization.

Copper Springs Area

The high-sulfide pyritic - phyllic alteration west of the Santa Anna Fault in the Copper Springs part of the alteration system exhibits a variable sulfide content of 3 to 5 percent, a pyrite to chalcopyrite ratio near 10 to 1, and a protore grade near .10 percent copper. The combination of higher total sulfides and the non-reactive nature of the schist results in conditions favorable for supergene enrichment and chalcocite occurs in an enrichment blanket 40 to 100 feet thick, averaging .35 to .40 percent copper, that is conformable to present topography. The present surface has substantial relief and has been eroded 1,000 feet or more beneath the Mid-Tertiary surface favorable for supergene enrichment in southern Arizona.

The pyritic - phyllic alteration weakens westward to exterior weak pyritic and propylitic altered schist in Sections 15 and 22, and similarly weakens in intensity southward from the erosionally resistant mountain at the south edge of Section 14 toward the schist-diorite contact in Section 23. Primary copper values of less than .10 percent copper in DDH KM-1 on top of the mountain are zoned northward to increasing primary copper values in CDH 301 on the north slope of the mountain. The higher-sulfide phyllic alteration in the S½ of Section 14 appears limited to the north by a poorly exposed, east-west trending fault zone near the schist-granite contact in Copper Springs Canyon, with the granite on the north side of the canyon characterized by low-sulfide pyritic alteration.

Three or four holes were drilled in the interior zone of mixed potassic - phyllic alteration and better-grade primary copper mineralization in the Copper Springs area. These drill holes were all

located in the vicinity of Santa Anna's Camp in the SE¼ of Section 14 relatively near the Santa Anna Fault Zone. Primary copper values encountered in these drill holes include: KM-9 (TD 215') 75' @ .27% Cu (0 - 75'), 65' @ .38% Cu (75' - 140'), 75' @ .24% Cu (140' - 215'), and KM A-12 (TD 549') 549' @ .12% Cu (core - poor recovery), (sludge samples 234.2' - 515.1') 280.9' @ .26% Cu. The higher values in KM-9 are believed to reflect some supergene chalcocite/oxide copper concentration in the Santa Anna Fault Zone. The average primary copper and molybdenum values in KM A-12 were estimated as approximately .20% Cu and .01% Mo. No data is available on the reported 1500 foot hole drilled by Phelps Dodge in 1967 as a test of the primary mineralization at depth in the area. These limited results indicate that, near Copper Springs, the alteration system contains very large amounts of sub-economic primary copper mineralization.

Chalcocite Enrichment Blanket

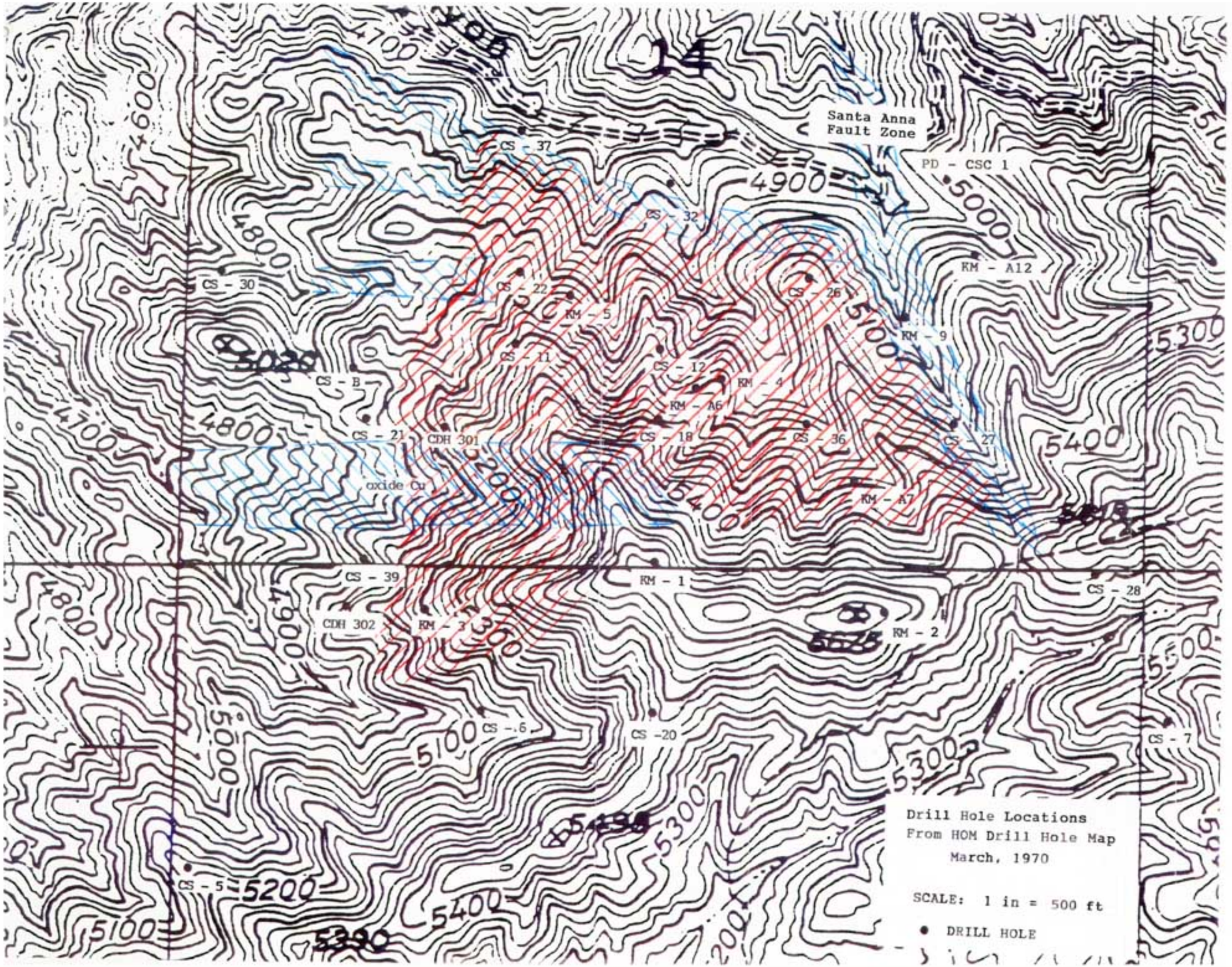
The supergene chalcocite blanket at Copper Springs is localized over the pyritic - phyllic altered schist in the S½ of Section 14 and is draped parallel to topography. The general area of chalcocite mineralization is outlined on both the drill hole location map and on the accompanying smaller scale, page size map of the prospect. The chalcocite mineralization is also illustrated in the following sections through the drill holes as well as in the accompanying tabulation of mineralized intercepts at Copper Springs. The blanket has been only partially defined by previous drilling and the better-grade mineralization occurs in a 1,000 to 2,000 foot wide band below an elevation of approximately 5,400 feet around the north and west flanks of the mountain in the S½ of Section 14. Chalcocite at higher elevations has been partially removed by oxidation and leaching with the mobilized copper migrating downslope to lower elevations.

The chalcocite blanket is 40 to 100 feet thick, averages approximately .35 to .40 percent copper, and is overlain by approximately 100 feet of leached and oxidized material. The contained copper in the chalcocite blanket could have been derived from leaching only a little more protore than that evident in the overlying oxidized zone. The copper in the blanket occurs as easily leached "sooty" chalcocite that coats and partially replaces pyrite in fractures and veinlets. The chalcocite blanket is self-leaching and copper is currently migrating laterally and downslope to be precipitated as both chalcocite and oxide copper minerals at lower elevations. These relationships are illustrated on the following 1" = 200' sections, which include copper values for larger mineralized intercepts in the drill holes.

Most of the old drill holes are located on resistant ridges and copper values on the ridges are probably not representative of the chalcocite blanket in the intervening more intensely fractured areas which should have been a more favorable site for supergene mineralization. The redistribution of copper in response to recent

DRILL HOLE INTERCEPTS AT COPPER SPRINGS

Drill Hole	TD	Depth feet	Interval	Percent copper	
Miami					
CDH 301	650'	75' - 150'	75'	.36%	
		305' - 360'	55'	.36%	
CDH 302	415'	150' - 175'	25'	.31%	
Kerr-McGee					
KM - 1	692'	412' - 421'	9'	.33%	
KM - 2	430'	232' - 252'	20'	.34%	
KM - 3	360'	130' - 195'	65'	.35%	
KM - 4	260'	130' - 210'	80'	.40%	
KM - 5	175'	100' - 141'	41'	.45%	
KM - A6	230'	120' - 198'	78'	.35%	(vertical)
KM - A7	187'	117' - 173'	56'	.24%	(vertical)
Humble					
CS - 11	268'	153' - 268'	115'	.30%	
CS - 12	249'	178' - 216'	38'	.29%	
CS - 18	311'	115' - 195'	80'	.14%	(oxide)
		195' - 238'	43'	.16%	
CS - 20	334'	247' - 255'	8'	.28%	
CS - 22	286'	45' - 75'	30'	.17%	(oxide)
		177.2'-257.7'	80.5'	.31%	
CS - 26	223'	136' - 200'	64'	.21%	
Shallow Drill Holes with Primary Chalcopyrite east of Chalcocite Blanket					
CS - 27	226'	0' - 226'	226	Approx .20%	(oxide & chpy)
KM - 9	215'	0' - 75'	75'	.27%	(oxide & cpy)
		75' - 140'	65'	.38%	(chpy)
Shallow Drill Holes Exterior to Chalcocite Blanket - Humble Drill Holes					
CS - 6	159'				
CS - 21	142'				
CS - 32	137'				
CS - 37	102'				
CS - 39	220'				



DRILL HOLE LOCATION MAP

COPPER SPRINGS PROSPECT

Summit Mining District

Gila County, Arizona

- Drill Hole

  CDH - Miami

  KM - Kerr-McGee

  CS - Humble

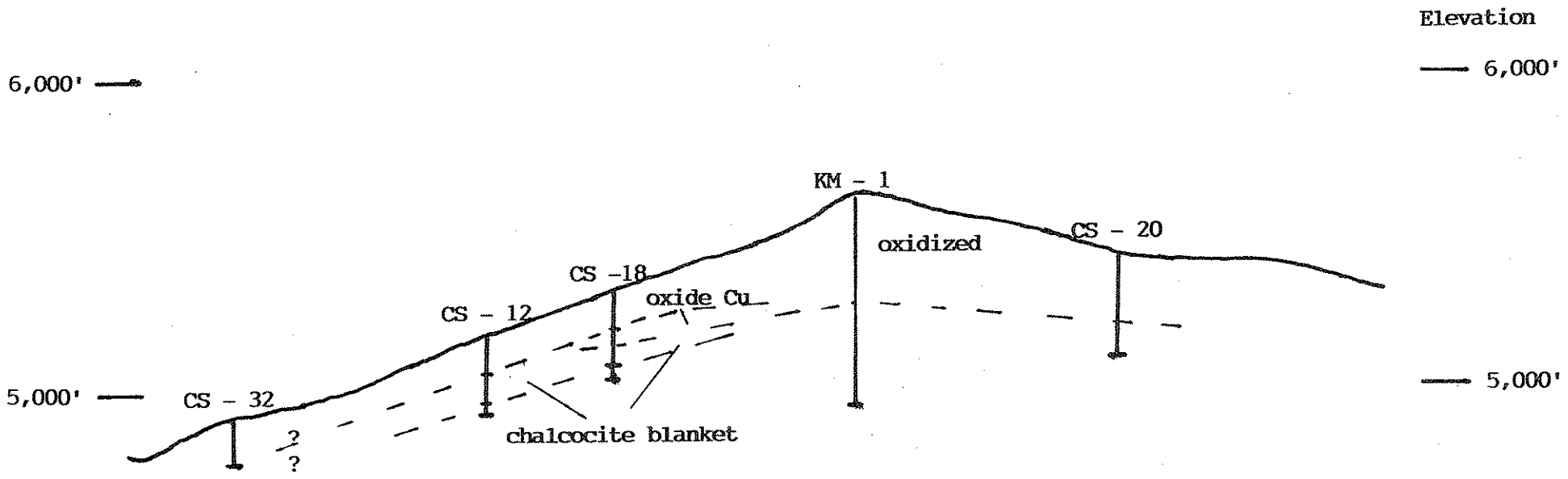
  CSC - Phelps Dodge

Chalcocite Blanket

Shear Zone

R. M. Corn - May 1995

COPPER SPRINGS AREA



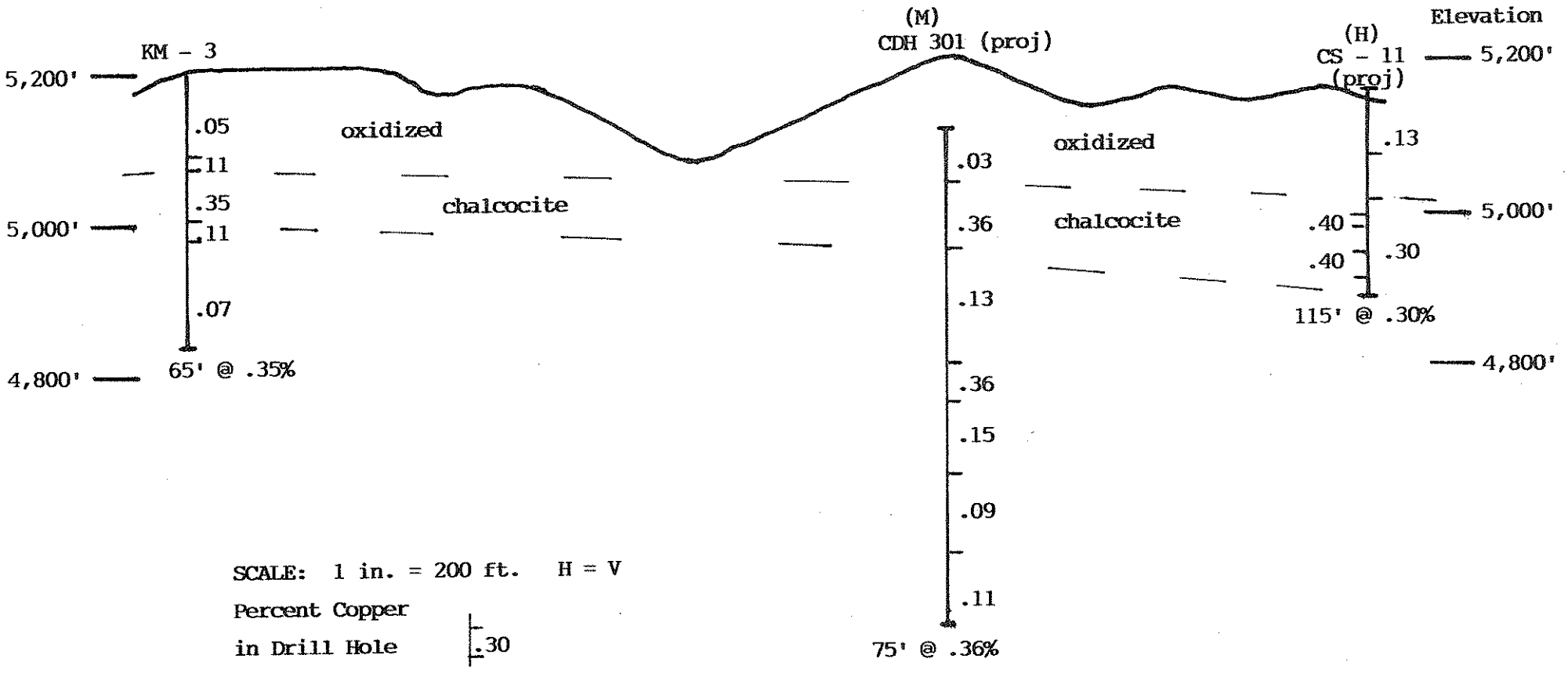
North - South Section Through Drill Hole KM - 1

Showing Draped Chalcocite Blanket

(Looking East)

SCALE: 1 in. = 500 ft.
H = V

COPPER SPRINGS AREA

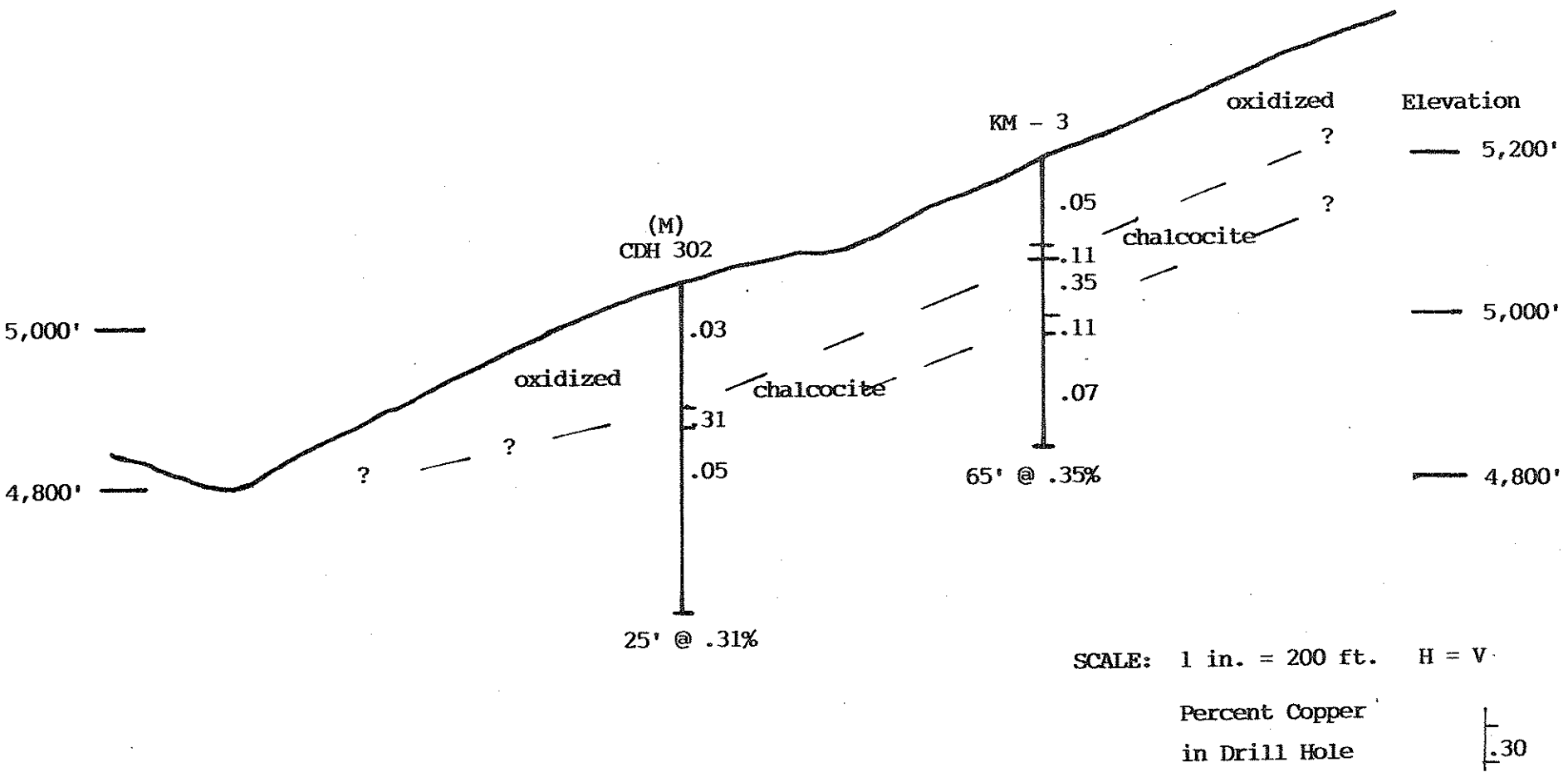


Southwest - Northeast Section Through Drill Holes KM - 3 and CS - 22

Showing Copper Values in Drill Holes

(Looking West)

COPPER SPRINGS AREA



SCALE: 1 in. = 200 ft. H = V

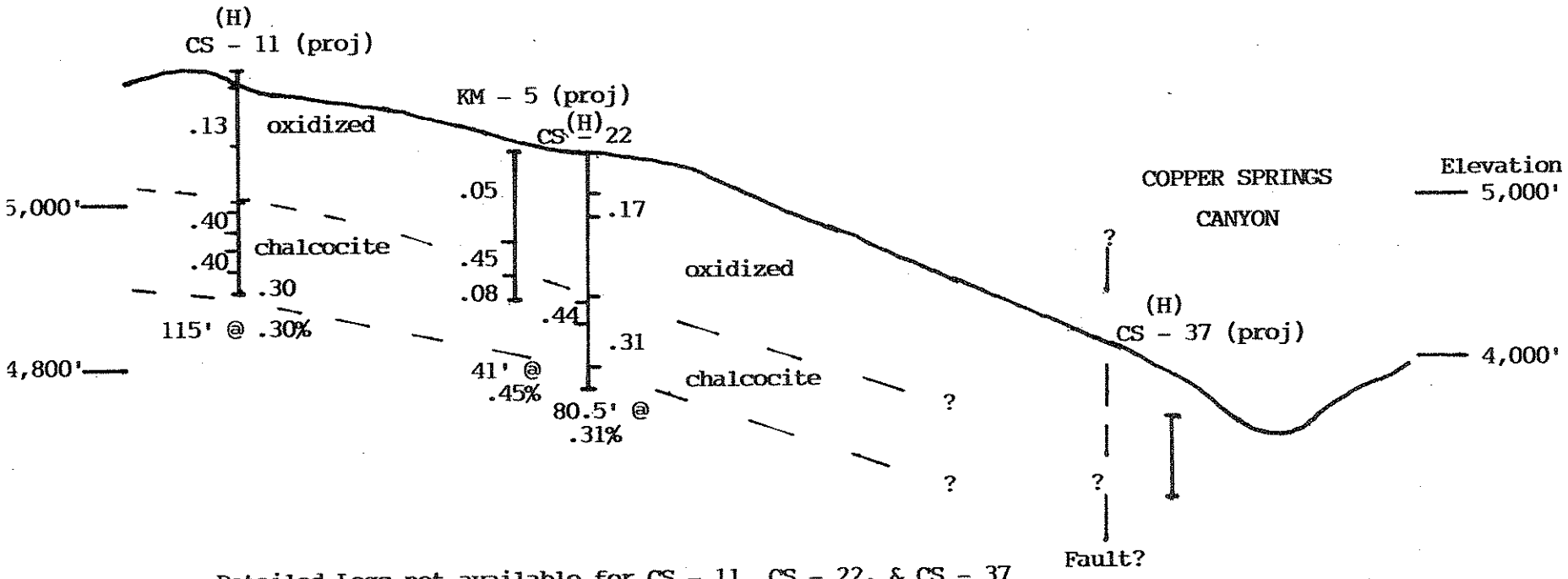
Percent Copper
in Drill Hole .30

East - West Section Through Drill Holes CDH 302 and KM - 3

Showing Copper Values in Drill Holes

(Looking North)

COPPER SPRINGS AREA



Detailed Logs not available for CS - 11, CS - 22, & CS - 37

Southwest - Northeast Section Through Drill Holes CS - 11 and CS - 22

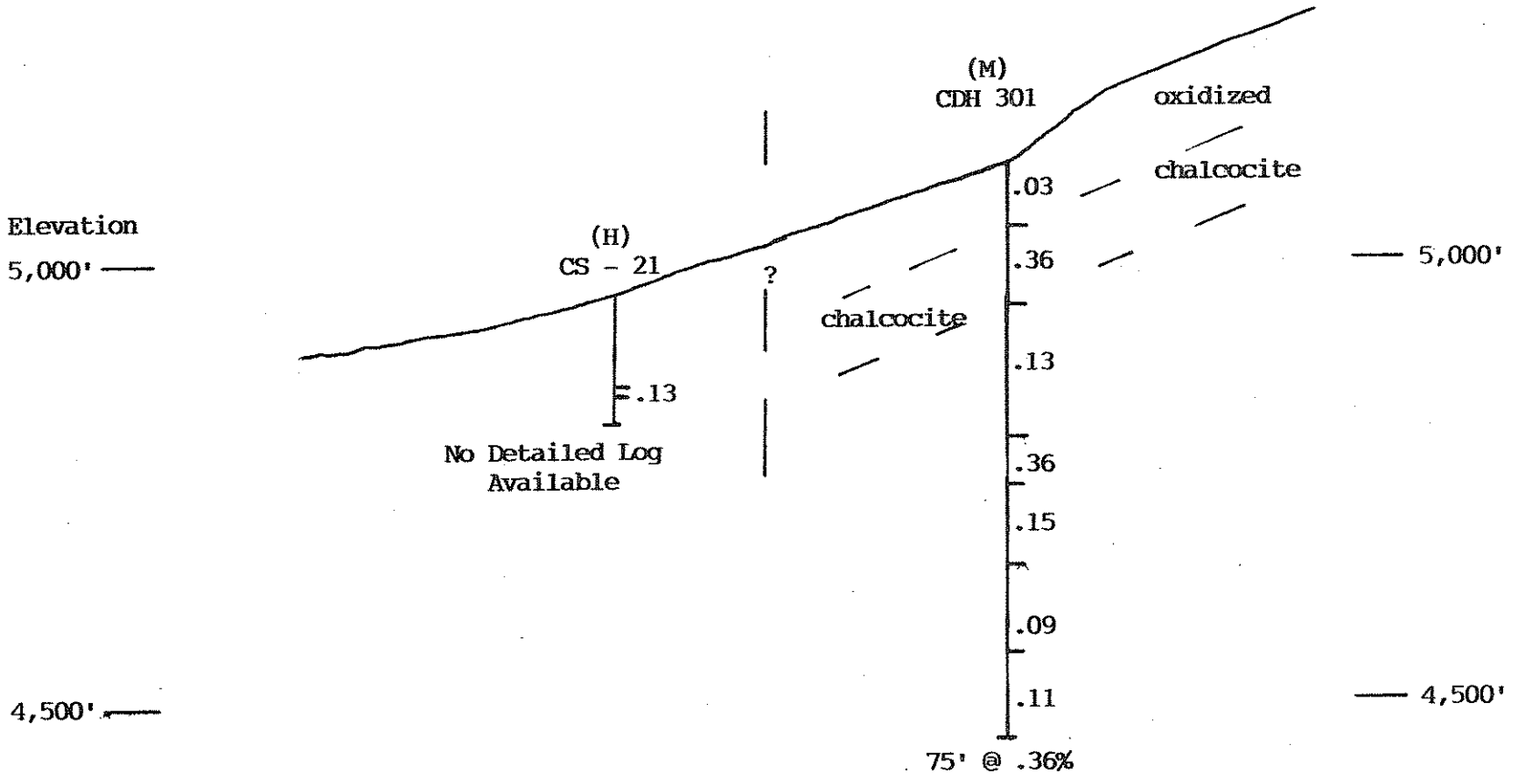
Showing Copper Values in Drill Holes

(Looking West)

SCALE: 1 in. = 200 ft. H = V

Percent Copper in Drill Hole .30

COPPER SPRINGS AREA



East - West Section Through Drill Holes CDH 301 and CS - 21

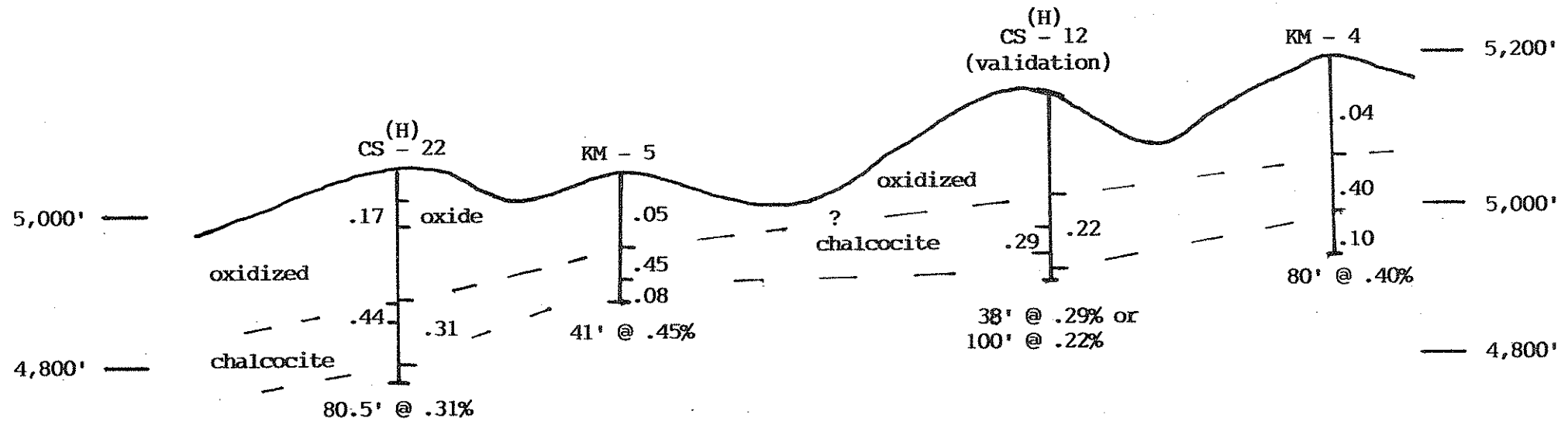
Showing Copper Values in Drill Holes

(Looking North)

SCALE: 1 in. = 200 ft.
H = V

Percent Copper
in Drill Hole .36

COPPER SPRINGS AREA



Detailed Logs not available
for CS –22 and CS – 12

SCALE: 1 in. = 200ft. H = V

Percent Copper
in Drill Hole .40

Northwest – Southeast Section Through Drill Holes CS – 22 and KM – 4

Showing Copper Values in Drill Holes

(Looking North)

erosion is probably responsible for the significantly larger (approx. 100 foot) intercepts of chalcocite in CDH 301, CS-11 and CS-22 on the west side of the blanket beneath surface exposures that do not appear to be particularly attractive. It is probably also responsible for the sharp variations in the grade and thickness of the chalcocite mineralization between adjacent drill holes and the concentration of supergene copper in zones of shearing and enhanced permeability.

Madera Area

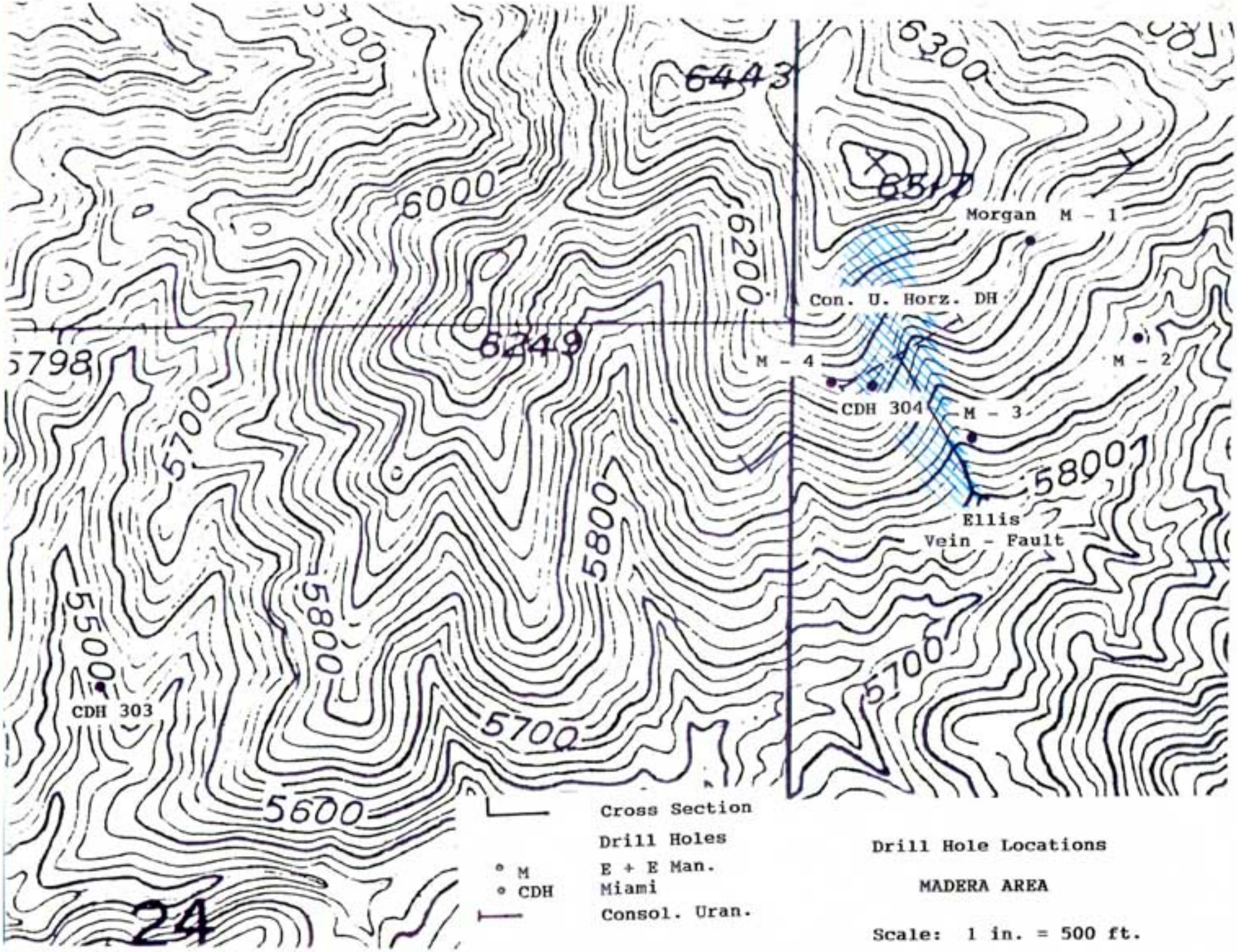
The total sulfide content of the eastern part of the alteration system, the Madera Area, is very low and was not sufficient to generate appreciable chalcocite except in the sheared zone associated with the Ellis vein. The primary copper values encountered in the exterior pyritic zone in this area are .05 to .10 percent copper and gradually increase to near .20 percent copper in the zone of mixed phyllic-potassic alteration.

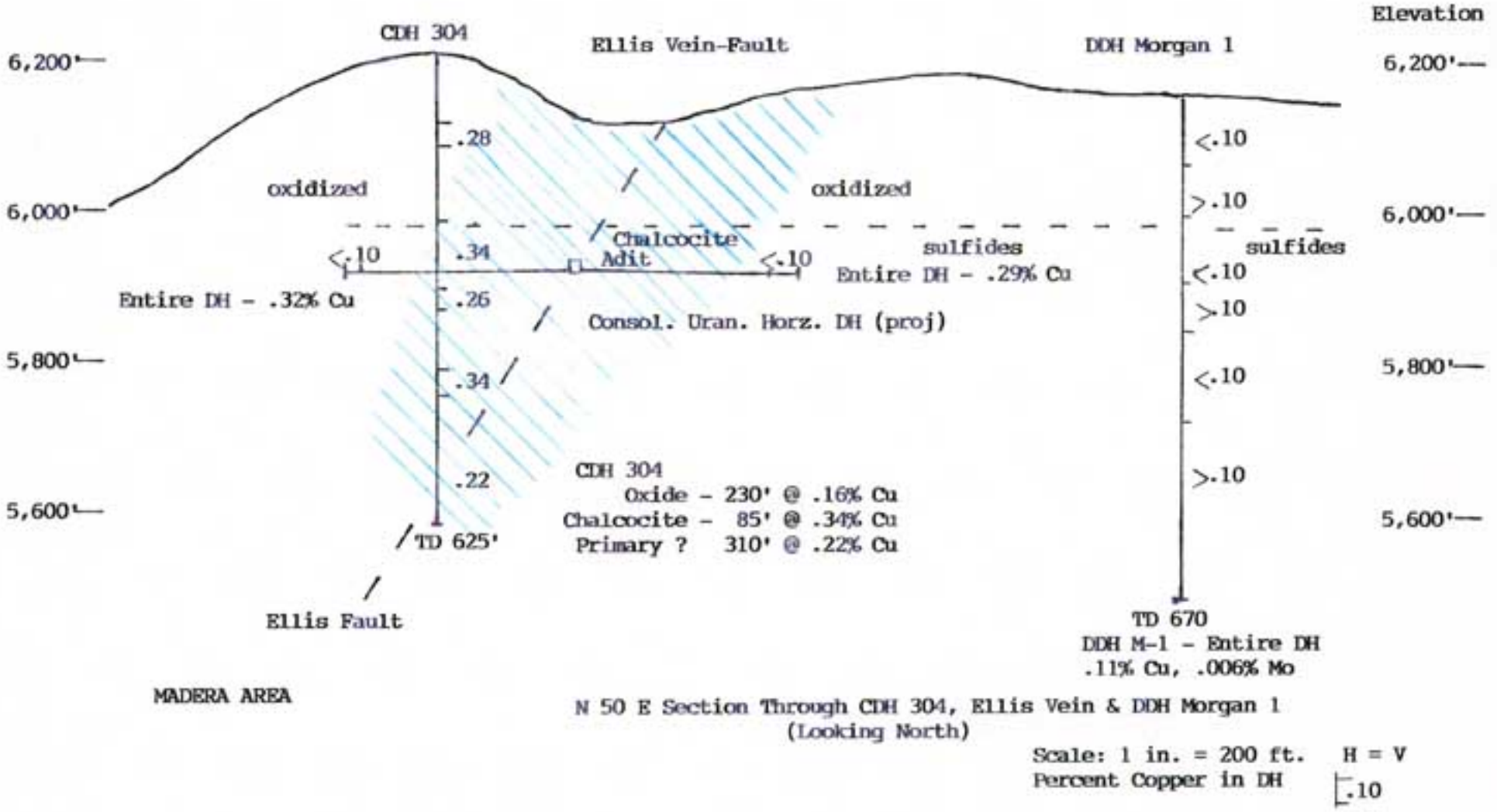
The eight drill holes that tested the Madera area, CDH 303, CDH 304, DDH Morgan 1 through DDH Morgan 4, and the two underground horizontal holes drilled across the Ellis shear zone by Consolidated Uranium Co. are shown on the accompanying Drill Hole Location Map. Miami's CDH 303 and the four Morgan holes drilled by E + E Management encountered uniform copper values of approximately .10 percent and did not exhibit any supergene enrichment. As shown on the accompanying section through CDH 304 and the two horizontal drill holes, appreciable copper values and chalcocite mineralization are limited to the 200 to 400 foot wide sheared zone along the Ellis vein. Old records indicate that although there was a narrow interval of .60 to .70 percent copper, the general tenor of the chalcocite mineralization in the Ellis shear zone is .30 to .40 percent copper as illustrated on the section.

These drilling results show that supergene chalcocite was very effectively concentrated within the sheared zone along the Ellis vein. This chalcocite concentration is an example of the potential for supergene copper mineralization in similar shear zones in the Copper Springs area to the west and indicates that the shear zone-hosted mineralization could have a significant exploration potential.

Exploration Potential

The pyritic schist protore at Copper Springs extends over an area approximately 4,000 feet east-west by 2,500 feet north-south, and is exposed through a vertical interval of almost 1,000 feet. A rough, "order of magnitude" estimate is that approximately 800 million pounds of copper were available and should have been leached and mobilized during past erosion of each 1,000 feet of this protore.


6100
6443
6300
6000
6200
6517
Morgan M - 1
Con. U. Horz. DH
6249
5798
M - 4
M - 2
CDH 304
M - 3
5700
5800
5800
Ellis
Vein - Fault
5500
5800
5700
CDH 303
5700
5600
Cross Section
Drill Holes
E + E Man.
Miami
Consol. Uran.
M
CDH
24
Drill Hole Locations
MADERA AREA
Scale: 1 in. = 500 ft.



MADERA AREA

N 50 E Section Through CDH 304, Ellis Vein & DDH Morgan 1
(Looking North)

Scale: 1 in. = 200 ft. H = V

Percent Copper in DH .10

Drill hole data show that the copper contained in the known chalcocite blanket could have been derived from little more than 300 feet of overlying protore and is only a fraction of the total copper that was available. Consequently, there should be a substantial amount of supergene copper remaining to be discovered at Copper Springs and the shear zones in the area represent worthwhile exploration targets.

Soluble copper, liberated by oxidation and leaching of both protore and chalcocite, would preferentially concentrate in permeable shear zones, migrate laterally and downslope, and would be precipitated at lower elevations as chalcocite, or where there were insufficient sulfides, as oxide copper minerals. The oxide copper minerals that coat pebbles and cement stream gravels for more than 2,000 feet downstream from the "copper springs" are a reflection of this process and indicate that soluble copper can migrate laterally for substantial distances before it is precipitated as "exotic" oxide copper minerals. Drill holes in the Ellis shear zone show how effectively supergene chalcocite was concentrated in zones of enhanced permeability and indicate that similar shear zones in the area could contain significant amounts of copper.

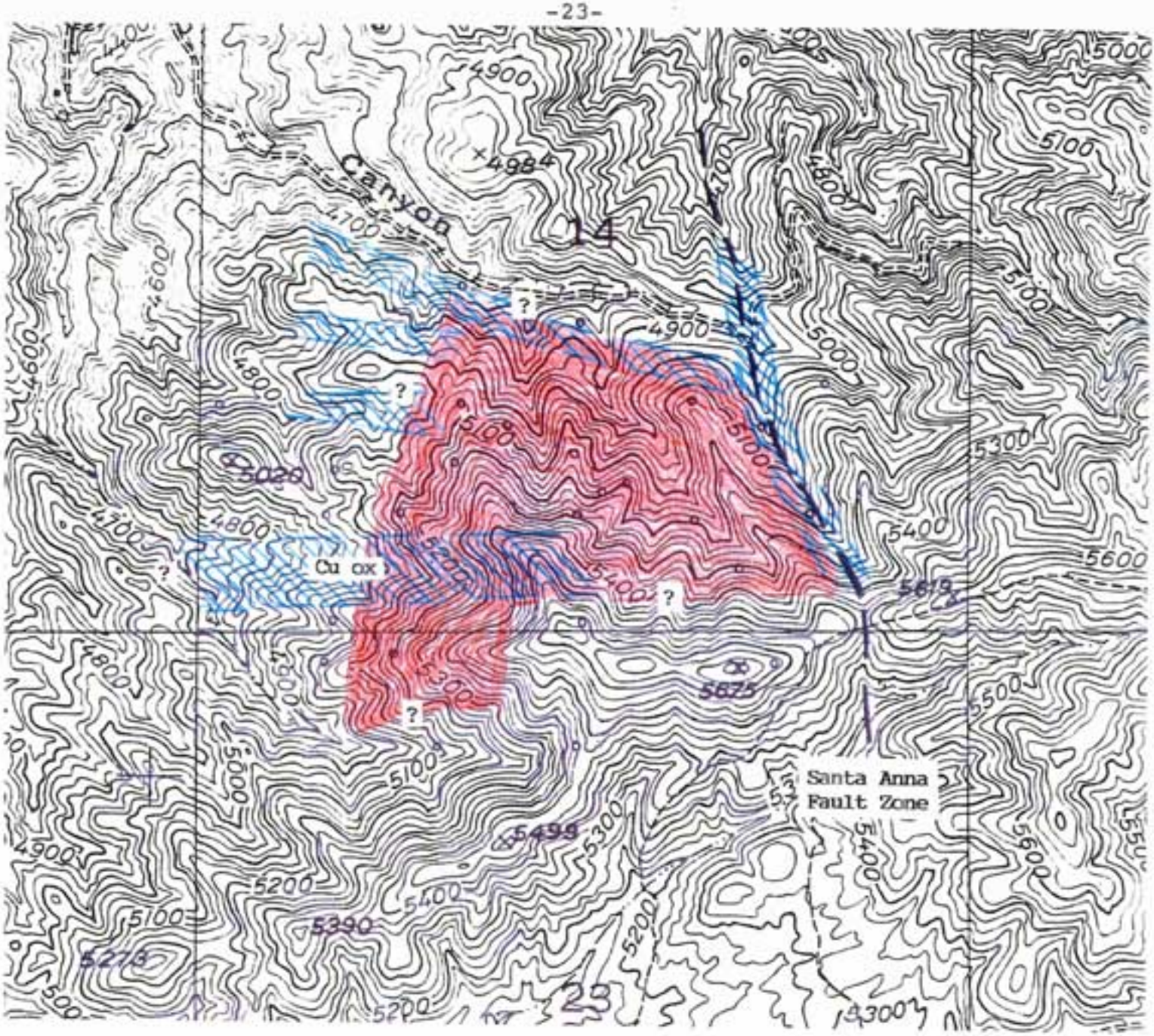
Zones of shearing and more intense fracturing that are believed to be favorable exploration targets for better-grade supergene chalcocite and/or oxide copper mineralization are shown on the accompanying map of the chalcocite blanket. They include:

1. The east-west trending 500 foot wide zone between drill holes CDH 301 and KM-3 on the west slope of the mountain in the SW¼ of Section 14. This non-resistant structural zone is marked by better chalcocite capping and scattered oxide copper float east of CDH 301. It appears to continue for 1,500 feet or more to the west to prospects in the bottom of the gulch. West of and downslope from the known chalcocite blanket, the zone exhibits prominent oxide copper minerals in highly fractured, low-sulfide schist exposed in road cuts between drill holes CS-21 and CS-39.

2. An indicated east-west trending shear zone in the vicinity if drill hole CS-22.

3. An indicated east-west trending shear zone near the base of the north slope of the mountain, south of Copper Springs Canyon and drill hole CS-37.

4. The north-south trending zone of shearing associated with the Santa Anna Fault. This zone exhibits prominent oxide copper minerals in road cuts and trenches north of Santa Anna's Camp as well as in the gulch to the south.



Generalized Outline of the Chalcocite Enrichment Blanket

Copper Springs Prospect

Summit Mining District, Gila County, Arizona

Chalcocite Blanket

Shear Zone
(potential chalcocite/oxide Cu)

Drill Hole

SCALE

1 in. = 1,000 ft.

These structural zones of enhanced permeability favorable for chalcocite mineralization at Copper Springs have never been tested by previous drilling. They could easily have an exploration potential of 10 million tons or more of .40 to .50 percent copper occurring as easily leached chalcocite and oxide copper minerals.

The exploration potential of the chalcocite blanket is estimated at approximately 40 million tons averaging approximately .30 to .40 percent copper. Higher-grade chalcocite and oxide copper mineralization in associated shear zones could represent an additional potential of 10 million tons. This chalcocite/oxide copper mineralization at Copper Springs is easily leached, near-surface, and would be amenable to low-cost open pit mining and treatment by SX - EW copper recovery. It represents a significant copper resource that should be of interest under current economic conditions.

Russell M. Corn May, 1997

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